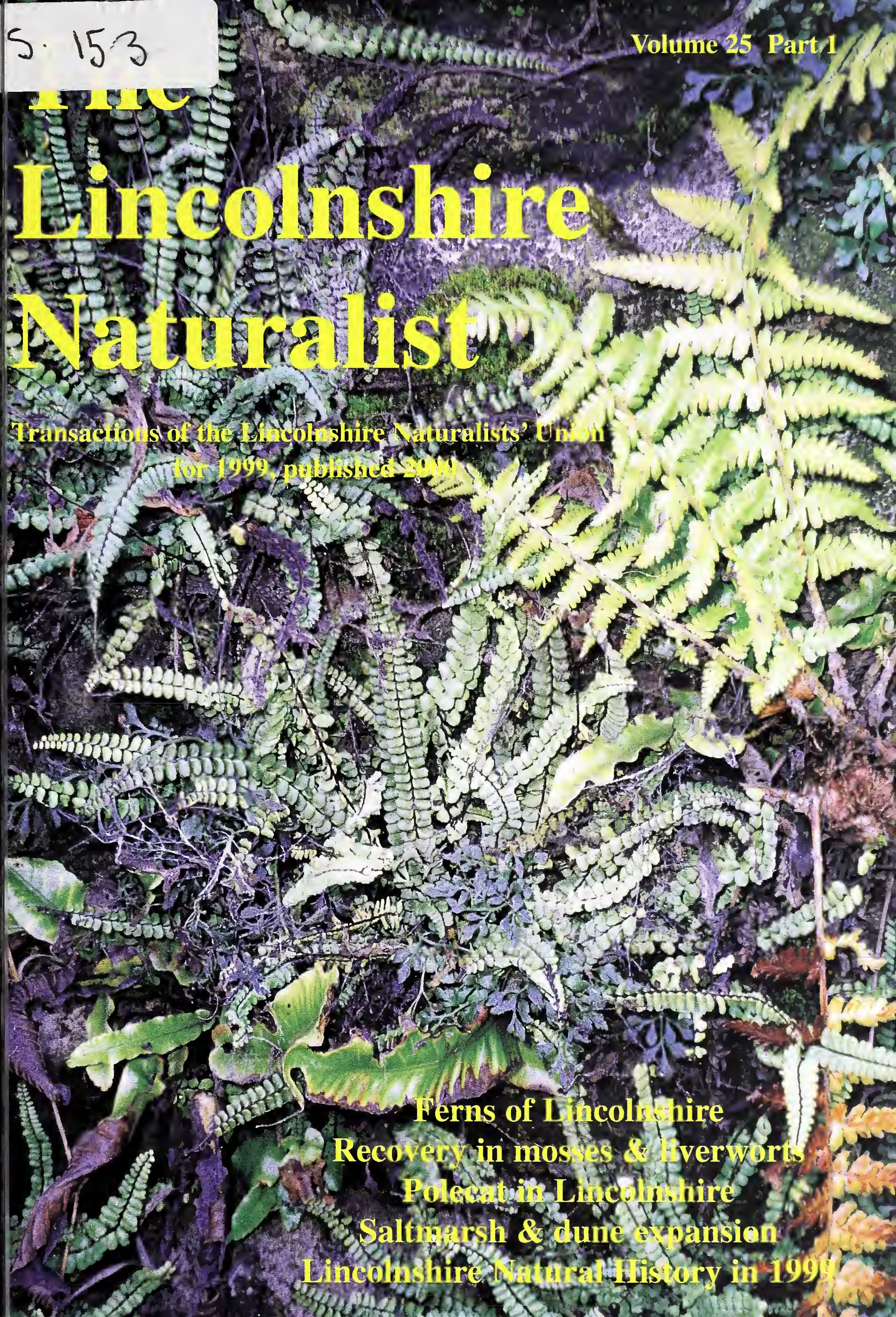




S. 153

Volume 25 Part 1

THE Lincolnshire Naturalist

Transactions of the Lincolnshire Naturalists' Union
for 1999, published 2000

Ferns of Lincolnshire
Recovery in mosses & liverworts
Polecat in Lincolnshire
Saltmarsh & dune expansion
Lincolnshire Natural History in 1999



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ISSN 0963-0961

printed by G&E 2000, Unit 2, A1 Parkway, Peterborough, PE2 6YN

edited by Roger Key

THE FERNS & THEIR ALLIES OF LINCOLNSHIRE

Graeme Clayton

“Nowt at all but bracken” Northern Farmer. Old Style V. x; Alfred Tennyson

As a native of Lincolnshire I have often found myself obliged to defend the county, under onslaught from the less enlightened, for its topography, yellow bellies and..... ferns! Hopefully this article will go some way towards establishing the status of ferns in Lincolnshire, something the county's foremost poet failed to appreciate!

The ferns & their allies (the clubmosses, quillworts & horsetails) make up a very ancient group of plants known as the Pteridophyta. Their origins go back approximately 400 million years, at least to the Upper Devonian, and thriving in the Carboniferous, when gigantic ancestors formed huge silent forests destined to become our coal measures.

The present pteridophyte flora of the U.K. is a relatively small one, just over 100 species including hybrids, out of a world distribution of around 10,000 species. Approximately half of the native flora have been recorded in Lincolnshire. Currently the county supports closer to a third of this diverse group. This may seem like a poor representation. I would regard



“Nowt at all but bracken” Alfred Tennyson

photo RS Key

it as an accurate reflection of a county that has undergone huge transformations in the twentieth century; not only has Lincolnshire undergone an agricultural revolution, in more recent years demand for development land has, and is having, an equally devastating effect. Habitat loss has been the major consequence. Bearing in mind that many of the pteridophytes that have been lost are on the limits of their environmental and geographical ranges, the picture is not as bleak as may seemingly appear.

Lincolnshire's situation in the east of the country means its climate is more continental than oceanic. Not for it the mitigating influence of the Gulf Stream, maintaining consistency and mellow conditions for its fern flora. The county experiences low levels and frequency of rainfall and the consequences of this, when coupled with its high summer temperatures, is a low relative humidity. The Island's coldest winter seas lap against the Lincolnshire shores, contributing to one of the highest annual temperature ranges of any county. The degree of cloud cover is less than favourable, considering how ameliorating prevention of penetrating sunshine and tempering diurnal temperature ranges can be for the fortunes of ferns. Potential water deficits, (ie the difference between a plant's evapotranspiration and the amount of rainfall it receives), are also relatively high in Lincolnshire. This has a particular bearing on pteridophyte distribution due to their dependence on moisture in their reproduction. Perhaps most insidious of all are the effects of atmospheric pollution. The pollution load that Lincolnshire has to bear, particularly from the Trent Valley power stations, is quite shameful. I cannot believe that the regular plumes discolouring the Lincolnshire skies do not have a detrimental consequence on the county's more sensitive flora and fauna. With the ferns and their allies relying upon damp conditions to complete their reproductive cycle, the rainfall they receive should be as pure as possible.

So, how do pteridophytes reproduce? This mystery pertained until comparatively recent times and was undoubtedly the origin of beliefs in a fern's magical qualities. The ability to produce "seed", seemingly without flowers, endowed them with properties thought able to cause invisibility. Their life-cycle is no less magical for it now being better understood. It is this function that unites the ferns and their allies into one group and not through any closer relationship.

Pteridophytes reproduce and disperse themselves by spores. In the *Pteropsida* (ferns), spore production takes place usually on the underside of the fronds or, less commonly, on specialised fronds dedicated to this function. The spores are produced in structures known as sporangia and occur in clusters called sori. Each sorus tends to have a scale-like covering called an indusium, whose characteristic shape, together with the positioning of the sori, can be diagnostic in establishing the identity of a fern.

Pteridophytes are often used as classic examples of exhibiting an alternation of generations ie their life history is in two independent stages. The most familiar stage is the plant itself, the sporophyte or spore-bearing plant. The shed spores germinate to form a



Lemon-scented fern sori

photo I Weston

simple, green, independent plant resembling a liverwort and called a prothallus. This is known as the gametophyte for it is here where the gametes, or sex cells, are produced. The male gametes are known as antherozoids and are produced within structures called antheridia. The female gametes, or ova, are produced within flask-shaped archegonia. Fertilisation is accomplished when a multi-flagellated antherozoid is attracted towards an archegonium, aided by its release of attractive chemicals, and swims to the ovum. A surface film of water has to be present to allow this to happen.

Following fertilisation the product of this fusion of gametes, the zygote, divides into a multicellular embryo made up of four parts: the foot, the root, the stem apex and the first-formed foliage leaf. This leaf bears little resemblance to later-formed fronds but is the beginnings of independence for the developing sporophyte. It does not become totally independent until the foot region has finished absorbing nutrients from the prothallus and adventitious roots have developed. The prothallus then dies away.



Broad buckler fern prothallus

photo RS Key

The *Lycopodiopsida* (clubmosses and quillworts) produce slight variations on this reproductive theme. Sadly this order is no longer represented in the county. The four recorded species, out of a total of seven native clubmosses, are now believed extinct in Lincolnshire. No quillwort (*Isoetes* sp.) has ever been, nor is ever likely to be, recorded here. The clubmosses are divided into two families; the *Lycopodiaceae* and the *Selaginellaceae*, the main differentiation being in their modes of reproduction.

Spore production in both families takes place in characteristic, cone-shaped structures known as strobili. They are made up of simple (undivided) leaves, clustered together at the top of a stem and usually held erect. In the *Lycopodiaceae* the strobili produce only one size of spore; a hard-walled, resilient structure. Consequently they are slow to germinate and may lay dormant for a number of seasons. The prothallus formed on germination is a tuber-like plant of variable shape according to species. Some species produce surface-living prothalli whilst most native species produce subterranean ones. Stag's-horn clubmoss *Lycopodium clavatum* is interesting in exhibiting variability in this respect. The prothallus may persist for many seasons, its survival made possible through association with endotrophic mycorrhiza. Some species also produce photosynthetic aerial lobes. The archegonia and antheridia may take some time developing, the antherozoids differing from the *Pteropsida* and the *Equisetopsida* (horsetails) in being merely bi-flagellated, a characteristic shared with the *Selaginellaceae*.

Where the *Selaginellaceae* differs quite markedly from the *Lycopodiaceae* is in the production of both microspores and megaspores in structures respectively known as microsporangia and megasporangia. The former are situated at the top of the strobilus and the latter at the bottom. Upon microspore dispersal the development of the microgametophyte begins in the production of antherozoids. The development of the macrogametophyte in the production of archegonia commences before the megaspores are shed. For successful fertilisation to take place as well as the presence of water the microspores need to land close to the dispersed megaspores.

Of the four clubmosses with confirmed records in Lincolnshire three belong to the *Lycopodiaceae* and one to the *Selaginellaceae*. Marsh clubmoss *Lycopodiella inundata* was formerly recorded from Crosby, Scotton and Linwood Warren. It was last seen on the golf links at Woodhall Spa in the 1970's. If the county is ever to be graced by a clubmoss presence in the future then it may well be this species that makes a return. Favours acidic sites flooded in winter and remaining damp through the summer it is prone to disappearing even from seemingly established colonies. This reflects its sensitivity to competition and short-term changes in weather patterns. However it is also just as likely to appear in new sites or reappear at old ones, arising from dormant spores that may have lain submerged for many years. It rarely forms dense patches due to the die back of the stems in winter. The terminal bud remains green and it is from here that spring growth commences. Its bright green strobili, borne on short erect stems, turn a dull yellow in mid summer. Amongst family members it shows the least differentiation of its fertile stems into strobili.

Stag's-horn/wolf's-claw clubmoss *Lycopodium clavatum* was formerly the most widespread of Lincolnshire's clubmosses. Recorded from all of the previously mentioned sites, its last sighting was in Skellingthorpe Woods, in an area now destroyed through development. It is a plant of drier heathland dominated by heather and, like all of the clubmosses, is very sensitive to fire. It is the only native species bearing its strobili on long, slender stalks. The strobili are usually in pairs, more rarely held singly or in threes. Its tightly crowded and overlapping leaves are given a silvery-grey sheen by their hair-like tips. These contrast with the yellowing strobili to give a truly attractive plant. This may, however, have contributed to its decline for it has traditionally been gathered for garlands. Done in the proper manner this was believed to confer on the collector an understanding of other animal and bird language! Its bright yellow spores have been used by pharmacists to produce 'Lycopodium Powder', said to be soothing and cooling, as well as for coating pills. The strobili were once gathered and crushed to produce a highly inflammable powder used in theatres for spectacular lighting effects. It was the last clubmoss species to be recorded in Lincolnshire.

Crosby was also the only known site for alpine clubmoss *Diphasiastrum alpinum*. Of all the county's clubmosses this has been the one recorded farthest from its more usual range in this country. It is a species rarely descending to the elevations pertaining in North Lincolnshire. The blue-green stem leaves are held in opposite pairs alternating at right angles up the stem. The stems have a multi-branched compact habit, the fertile ones arising in erect, untidy rosette-like clusters. There may be the possibility that the Crosby colony was in fact hybrid alpine clubmoss *Diphasiastrum x issleri*, a plant recorded from other lowland heathland sites in England.

The sole representative of the *Selaginellaceae* once recorded in the county was lesser clubmoss *Selaginella selaginoides*. Twigmoor and Manton provide records for this species from the 19th century but it could be found up until the early 1960's at Scotton. It is a plant of exposed sites, especially at lower elevations, and prefers damp, calcareous conditions.

Its diminutive nature make this plant easily overlooked when growing in a base-rich turf. Numerous creeping stems are made more conspicuous by upright fertile branches clothed in toothed leaves bearing sporangia at their bases.

The *Equisetopsida*, prehistorically a once abundant order, has now only one extant family, the *Equisetaceae*, made up of a solitary genus. There are around 25 species world wide with at least as many hybrids. Lincolnshire supports six species, plus hybrids, out of an indigenous UK representation of eight. The county can also boast an introduction recorded at only one other site in the UK.

The *Equisetaceae* exhibit slight variations in their reproduction in addition to what has already been discussed. Spore production takes place in strobili but these may either be situated at the apical point of the stem or, in certain species, on specialised fertile stems, containing no chlorophyll and produced in advance of the vegetative stems. Minute elaters attached to each spore probably aid dispersal. Although not classed as truly heterosporous, as in *Selaginella*, the spores will germinate into prothalli that bear either antheridia or archegonia. Reproduction by this manner seems secondary to most *Equisetum* species with vegetative spread their primary mode.



Common/field horsetail strobili

photo I Weston

Identification of horsetails is straightforward provided attention is paid to three areas of the plant; the leaf sheath encompassing the stem, the lower arrangement of nodes along the branches and the transverse section of the stem (particularly important in establishing hybrids).

Rough horsetail or Dutch rush *Equisetum hyemale* is scarce in Lincolnshire but found on dyke sides at Moortown and North Kelsey. It is a blue-green unbranched plant, initially with green leaf sheaths which soon blacken following the falling away of the sheath teeth. If present, the strobilus has a finely pointed apex. This appropriately named plant is characteristic of the family with its surface deposits of silica particles. The "Dutch" connection no doubt originates from the bundles of this plant once imported to meet the demand for its use as an abrasive. All members of this group have been used to some degree for their burnishing properties but *E. hyemale* is particularly well endowed. Indeed

its exceptionally high silica content also enabled its early use as gas mantles. Its cylindrical form would persist following burning which would consequently glow incandescently when further burnt appropriately.

In 1947 following channel engineering of the River Witham below Boston, Lincolnshire became the first county in the UK with branched/Boston horsetail *Equisetum ramosissimum*. It may have originated from ballast brought in at the time. Since then the colony at Slippery Gowt has been joined by one at Weston-super-Mare. It differs from *E. hyemale* in its branched stems, a much smaller diameter stem cavity and with its leaf sheath teeth being black and persistent. It can reach up to 100cms.

Water/smooth horsetail *Equisetum fluviatile* is a much commoner plant and has been recorded from over 65% of the 95 10km squares covering the county. The south-east of Lincolnshire appears to be the least attractive area for this species. It is the most aquatic of all our *Equisetum* species with the largest stem cavity diameter of all and may reach 150cms in height. The stem colour blends from dark green through to yellow. The green leaf sheaths may have a tinge of orange and have numerous persistent teeth which are short brown-black. If strobili are present they have a blunt to round tip.

The commonest horsetail in the county and recorded from all squares, is common/field horsetail *Equisetum arvense*. To gardeners it is a tiresome weed but its fertile stems deserve closer appreciation. They are white to pinkish and have black-brown sheath teeth almost equal to the length of the sheath. It can tolerate drier conditions than any other *Equisetum* species as well as inhospitable sites such as those dominated by industrial waste. Here it may act as an important primary coloniser. The sheaths on the sterile stems lack any translucent membranous margins to their teeth. The side branches tend towards the erect but it is a very variable plant. It can become almost prostrate in sands and gravels whilst its branches may branch and droop in the shade or when environmentally stressed. Such variations can lead to confusion with other species, especially *E. palustre*. The central stem cavity of *E. arvense* tends to be of greater diameter than the very narrow one of *E. palustre*. However the diagnostic characteristic separating the two is the spreading nature of the sheath teeth on the side branches of *arvense*. On *palustre* they grasp the branch.

This characteristic is usually inherited where *E. fluviatile* and *E. arvense* produce a hybrid; shore horsetail *Equisetum x litorale*. It has been recorded at a number of sites in Lincolnshire, most recently at Waddington, Saltfleetby and at Hartsholme Country Park. Other distinguishing features include a concentration of the branching in the central area of the stem leading to a long, naked apical portion. The central stem cavity is of intermediate diameter and the colony itself will appear robust, exhibiting a high degree of hybrid vigour.

Marsh horsetail *Equisetum palustre* is a much commoner species recorded from over 70% of Lincolnshire's 10km squares. The plant thrives in bash-rich meadows on deep fertile soils where it spreads into drainage ditches. It can tolerate more stagnant conditions than *E. telmateia*, as well as more acidic ones. It never reaches the same proportions as that species or *E. fluviatile*, as already mentioned, and is more likely to be confused with *E. arvense*. Another distinguishing feature between these two species is the length of the first internode on a centrally produced branch. On *E. arvense* this will be equal or longer than the length of the corresponding stem leaf sheath. On *E. palustre* the internodal distances is noticeably shorter (the mnemonic ALPS applies; *arvense* long, *palustre* short!).

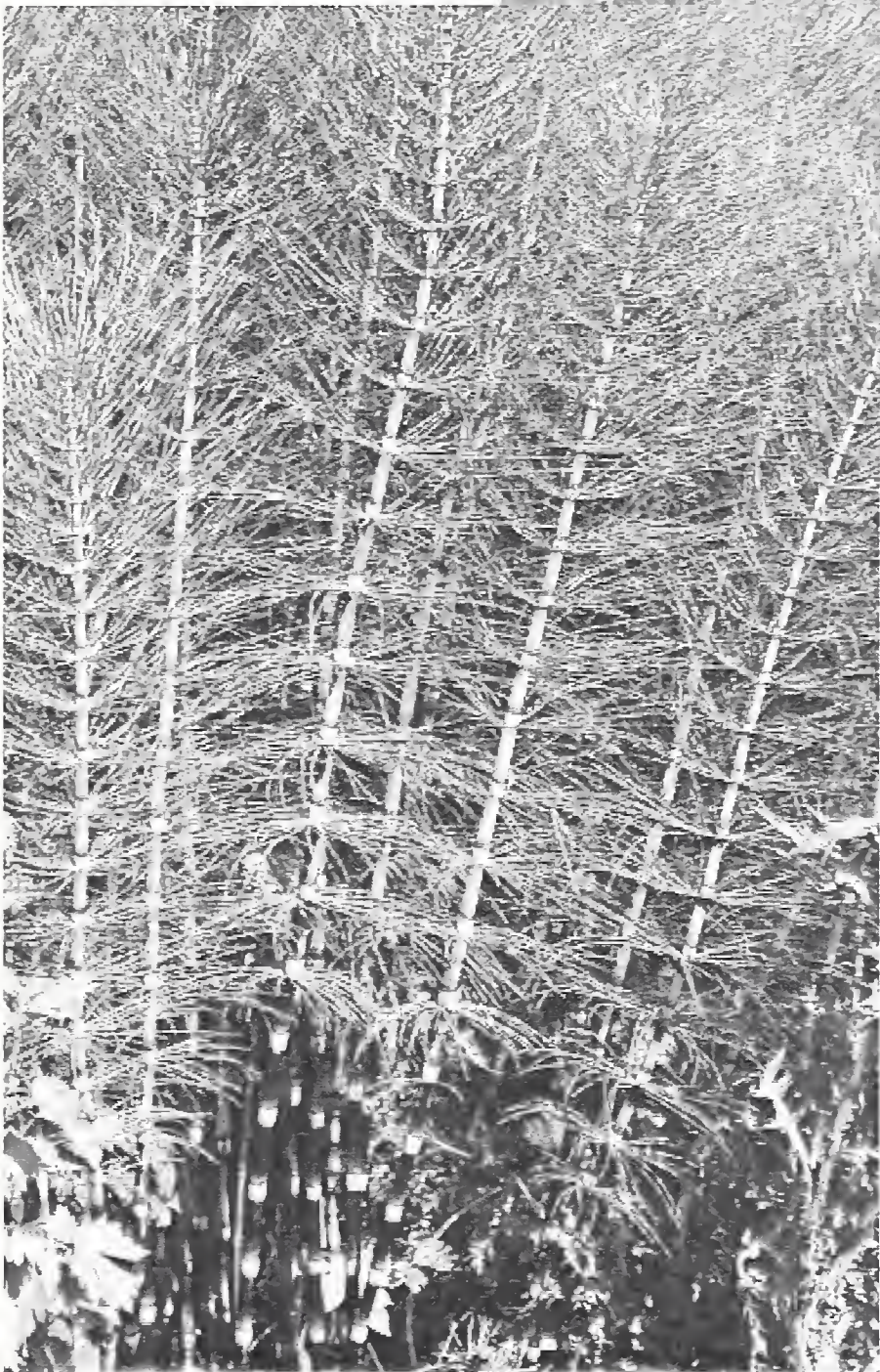
Wood horsetail *Equisetum sylvaticum* is a very graceful plant of damp woods, rarely

reaching over 50cms. Having been declining in the county for a number of years, disappearing from past haunts such as Wainfleet, Legsby, Moortown and Nocton, it can still be found at Crosby Warren. It is the only indigenous horsetail producing branched branches. The stem sheaths are inflated with their teeth fused into 4/5 papery lobes which fit loosely around the stem.

Our tallest indigenous horsetail is great horsetail *Equisetum telmateia* (plate 1). It can form



Wood horsetail photo RS Key



Great horsetail

photo I Weston

conspicuous colonies up to 150cms high and prefers deep clay soils receiving lime-rich seepage, a frequent situation along the spring line of the Lincolnshire Wolds. A colony at Claxby thrives in just these conditions, spreading into a ditch where its demand for a high dissolved oxygen content in the groundwater is more than satisfied. The sheath teeth on the fertile stems are short in proportion to the length of the leaf sheath. On the much taller sterile stems the bright green, up-curved branches contrast with the very pale stems.

The final division of the *Pteridophyta* is the one most associated with it, the *Pteropsida*, the true ferns. Historically 34 ferns from 12 families have been recorded in the county. These include numerous hybrids, subspecies, introductions and species arising from taxonomic reassessments. Currently the list of Lincolnshire *Pteropsida* is closer to 25 representing 11 families.

Family groupings within the *Pteropsida* are founded on very technical characters not always obvious in the field. It is therefore more appropriate to take account of the following features of the fronds, stalks, sori and indusium in pursuing field identification. With the fronds observe whether they arise from an erect rhizome in a tufted fashion or if they are appearing at intervals from a creeping rhizome. Check if two different types of frond are produced; one fertile bearing sori the other sterile. Attention should then be paid to the division of the fronds - whether once, into pinnae or further divided (and possibly again) into pinnules; hence pinnate, bi-pinnate and tri-pinnate frond characteristics. The portion of the stem below the commencement of the pinnae is known as the stalk or stipe. From the first pinna to the apex of the frond is called the rachis. The shape and colour of any scales clothing the stalk and rachis is important to note, as well as the degree of scaling. When checking the sori notice should be taken of their shape and position. If they are covered by an indusium its form ought to be taken account of.

Two members of the *Ophioglossaceae* are to be found in Lincolnshire. Both species have appearances unlike those normally associated with ferns. Adder's tongue *Ophioglossum vulgatum* has been recorded throughout the county, preferring undisturbed meadows on calcareous soils and tending to flourish in damp pastures over clay. It also occurs in sand dune slacks and moist hollows in heaths. Only the south-east of Lincolnshire has proved unfavourable for this fern. Recent new sites include Binbrook, Covenham and Messingham, where it favours a particularly wet area. The stalkless, spathe-like vegetative blade is normally solitary, more or less oval and sheaths the taller fertile spike. The upper part of this consists of stalkless sporangia ranked in opposite pairs. Where colonies do occur it is not unusual to



Adder's tongue fern

photo I Weston

find plants failing to produce fertile spikes. The whole plant rarely exceeds 15cms. The prothalli are subterranean and like the clubmosses have a mutual association with endotrophic mycorrhizal fungi, a situation often evident in the sporophyte too. It was a more frequently encountered fern when adders were also more common. In the context of the doctrine of signatures here was nature providing an obvious efficacy for dealing with snake bites. Up to the beginning of the last century it was still gathered in quantity to create a preparation for the treatment of wounds.

Moonwort *Botrychium lunaria* is a rarer plant, sharing similar habits to adder's tongue but favouring the drier parts. It frequents more upland areas and hence is scarcer in Lincolnshire. It tends to be a shorter plant than *Ophioglossum* but equally fleshy. The vegetative frond is pinnate, the pinnae being fan shaped and more or less opposite. The fertile spike emerges from the base of the frond and may be bi-pinnate or tri-pinnate. The sporangia are borne along the margins of each of the spike's divisions and resemble a miniature bunch of grapes. Its sporadic appearances may have added to its mystery within folklore. As well as being considered useful in treating wounds, it was also believed to possess the ability to open locks and unshoe horses.

The *Osmundaceae* contains only one European species; royal fern *Osmunda regalis* (plate 2) is becoming a scarce fern in the county through loss of its favoured habitats; acidic

bogs and damp woodland. Current sites might all be considered as introductions, however naturalisation is beginning in woodlands away from the main populations in both Hartsholme and Swanholme. It is a strikingly majestic plant, the main reason why it suffered so badly when collectors rampaged through the country's pteridophyte flora during the Victorian fern craze. Its often raised, erect rhizome also became sought after for its suitability for establishing epiphytic orchids upon. The unfurling croziers are covered in a fine pubescence. When expanded the fronds are bi-pinnate, the oblong pinnules usually having entire margins tapering to rounded or blunt points. The central fronds of the crown tend to be held more erect, the uppermost divisions becoming a fertile cluster. These brown fertile tassels of large sporangia contrast with the light green of the fronds and add



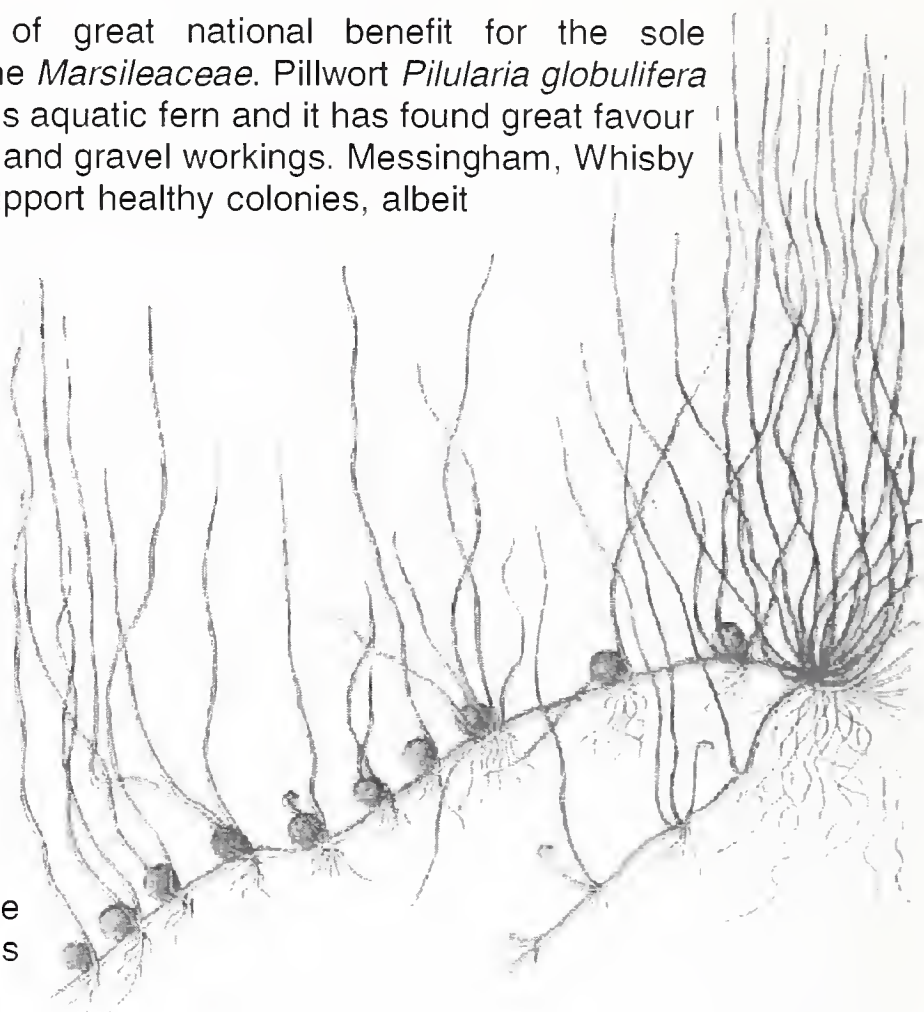
Moonwort

photo I Weston

to the unmistakable nature of the plant. The fact that a mature specimen can arch its fronds over the head of an adult person further adds to its individuality. Even young plants in dense woodland can often be spotted at a distance in winter with their straw yellow fronds that have turned with the first frosts.

Only one representative of the *Adiantaceae* has ever been recorded in Lincolnshire. Maidenhair fern (*Adiantum capillus-veneris*) was recorded from Rauceby Quarry in the 1950's. It was suspected that spores had been blown on to the quarry face from a nearby garden. This delicate plant is a rare fern of moist sheltered areas, mainly by the sea. Its drooping fronds are either pinnate or bi-pinnate but may become tri-pinnate in larger specimens. The pinnules are fan shaped and deeply notched or incised. Fertile pinnules bear reflexed lobes at their apices creating crescent shaped flaps which act as indusia protecting the linear sori. It is frost tender and therefore unlikely to ever establish itself in the county.

Lincolnshire has become of great national benefit for the sole representative in the UK of the *Marsileaceae*. Pillwort *Pilularia globulifera* (plate 3) is the only indigenous aquatic fern and it has found great favour in the county in flooded sand and gravel workings. Messingham, Whisby and Swanholme Lakes all support healthy colonies, albeit spasmodically which is the nature of the plant. It is a small marginal or submerged plant resembling a tiny rush. The cylindrical fronds arise from a rhizome which can spread and branch over a considerable distance in a season. Pea-like sporocarps are produced at the base of the frond and give the plant its name. Being heterosporous these contain either male or female spores. Pillwort is a European endemic and is regarded as an endangered species on the continent. Lincolnshire's *Pilularia* may yet become of world importance!



Pillwort

drawing ME Step 1908

Two members of the *Polypodiaceae* occur in the county. Common polypody *Polypodium vulgare* has been the most frequently recorded although in recent years some thriving colonies of western/intermediate polypody *P. interjectum* have been discovered, particularly in North Lincolnshire. There is also a record for the hybrid between the two species, *P. x mantoniae*, in the 1978 Atlas (Jermy et al, 1978) from TF09. The polypodies are evergreen ferns with pinnate fronds rarely exceeding 50cms and usually much less. The main difference between the two Lincolnshire species is in the overall frond shape. In *P. vulgare* it is a narrow and parallel-sided, the pinnae margins being entire. In *P. interjectum* the frond is more ovate, the longest pinnae being just below the middle, their margins being weakly serrated. The lowest pair of pinnae are also strongly inflexed. All polypodies lack indusia, the bare sori on *P. vulgare* being circular whereas they are more oval on *P. interjectum*. Although *P. vulgare* has been recorded from Willingham Woods

both species tend locally to colonise walls, *P. interjectum* tolerating more basic conditions. One exceptional site for this species is on the Butcher's Arms car park wall in West Halton. Park the car, spot the fern but before heading indoors to celebrate your find check out the other side of the wall. It is festooned!



Common polypody

photo I Weston

The commonest fern in the county, if not the world, belongs to the *Hypolepidaceae*; common bracken *Pteridium aquilinum* (plate 4). Nationally it is said to cover an area larger than Lincolnshire. The species has now been subdivided and it is almost certain that all the county records are for subspecies *aquilinum*. It is the bracken of agricultural nightmares and is readily identified by not only its vigorous and invasive nature but by the tomentum of short white hairs, overlain by longer reddish-brown ones, covering the expanding croziers. Other subspecies either have exclusively white hairs or they shed the tomentum relatively quickly. Although seemingly only absent from coastal sites and the south-east of Lincolnshire when considering its 10km square distribution, this belies the plant's intolerance for calcareous soils and some squares have a very limited representation. Its reputation as a serious pest is justified but its control by indiscriminate spraying is not. Some stands may shelter moonwort, a not infrequent situation. It is known to be carcinogenic to livestock, maybe also to humans, but of immediate concern is that large stands can harbour ticks, vectors of Lyme disease. It is a plant best avoided.

The *Thelypteridaceae* is represented in the county by two ferns, neither of which is particularly common. There are only two sites for marsh fern *Thelypteris palustris*, although it has been diminishing at the northern site on a farm near Crowle for some years. It reflects the national situation of the plant become scarcer. In contrast it is now well

established at the other site in an old ballast pit at Sleaford. It is readily identified by its dark, creeping rhizome just below the surface, giving rise to pinnately divided, deeply pinnatifid fronds at regular intervals. First to appear are the shorter (50cms) sterile fronds a month before taller (80 cms) fertile ones. These seem narrower than the sterile fronds as the margins of the pinnules tend to curl under. The sori tend towards the margins of the undersides of the pinnules and are covered by small, toothed, kidney-shaped indusia.

Mountain or lemon-scented fern *Oreopteris limbosperma* (plate 5) is more frequently encountered in Lincolnshire. Its passing resemblances to male fern *Dryopteris filix-mas* may also cause it to go unrecorded. Although one of its common names suggests otherwise, it does inhabit lowland areas, mainly wet woodland on acid soils. Crushing just a few pinnae will release a pleasant lemon fragrance. Its fronds reach 80cms, are pinnate, deeply pinnatifid and narrow noticeably to their bases. They form erect crowns arising from an ascending rhizome. The sori occupy the margins of the undersides of the pinnules, are naked and turn black with maturity. It is a fern becoming rarer in Lincolnshire but can still be found at Woodhall.

The *Aspleniaceae* has a stronger representation in the county. Some of the species have relatively recently been sub-divided, requiring a re-assessment of Lincolnshire representatives and some have become extinct in the county. Most are doing surprisingly well despite the difficult conditions the droughts of the late 1980's and early 1990's presented them with. Hart's-tongue fern *Phyllitis scolopendrium* is well distributed throughout Lincolnshire without ever becoming particularly common. It is one of the few



Hart's-tongue fern

photo I Weston

indigenous ferns that cannot be mistaken for any other and is unique in producing undivided, strap-like leaves which are wintergreen. The linear sori are set obliquely either side of the rachis. It will tolerate acidic conditions but is more frequently encountered in calcareous woodland or on basic rocks and walls. Hart's-tongue has a habit of appearing down drains, a not uncommon situation in Lincolnshire, and has been a frequent coloniser of the interior surfaces of wells in the past. This seemingly spontaneous manifestation in the walls of the essential centre of a community and its evergreen quality endowed the fern with magical qualities. Medicinal uses included laying the fronds over burns and scalds as well as being an astringent for ulcers and wounds. It has also had romantic connotations, presumably linked to the

unfurling frond initially resembling a heart from which a tongue emerges. When colonising walls in Lincolnshire it is often found in the company of other *Aspleniaceae*, most spectacularly on a farm wall Vi Wilkin has discovered at Flixborough where it is found amongst black spleenwort *Asplenium adiantum-nigrum*, maidenhair spleenwort *A. trichomanes subsp. quadrivalens* and wall rue *A. ruta-muraria*. This five-fern wall also supports male fern *Dryopteris filix-mas*. Under different conditions it can be the sole coloniser, as on sheltered walls on the campuses at Caythorpe and Riseholme and the more recently discovered beautiful example at Branston Hall. In such positions the fern's requirements of high year-round humidity and protection from desiccating winter winds are satisfied.



Five fern wall at Flixborough

photo I Weston

The remainder of the Lincolnshire spleenworts experience mixed fortunes but new sites are being discovered all the time and their current status appears much healthier than recently thought. *Asplenium adiantum-nigrum* has a predominantly northern, eastern and southern distribution in the county. Lincolnshire seems to possess a central black spleenwort hole, the mystery possibly linked to low localised rainfall and/or atmospheric pollution. It is a fern that may give the initial impression of being merely a youthful something else and be overlooked. The ferns dark stipe, which accounts for its common name, distinguishes it apart from the more mundane. Its fronds are shiny, dark green and rarely over 50cm. They are wintergreen, triangular in outline and, if the whole frond is not curving, at least the upper pinnae are. The pinnae vary in shape depending on their position on the rachis. A frond may vary from being pinnate to tri-pinnate with the uppermost pinnae being merely oval or linear. The sori are generally linear and may cover most of the undersides of fertile fronds, another quite distinguishing feature. They have whitish indusia. As well as the Flixborough wall a thriving colony cascades down the line of a blocked drain pipe on the watermill wall at Horncastle accompanied by hart's tongue fern and male fern.

Maidenhair spleenwort has been subdivided and it is almost certain that all Lincolnshire plants are *Asplenium trichomanes* subsp. *quadrivalens* (cover). It is a colonist of old mortar of walls and is the commonest and most widespread of the three subspecies. There are a number of characteristics which distinguish subsp. *quadrivalens* from the more limited distribution of subsp. *pachyrachis* and the northern and more westerly occurring subsp. *trichomanes*. The pinnae are generally more closely spaced, rather squared, spreading nearly perpendicularly to the rachis. They are persistent in that they remain on the rachis until the whole frond is shed, maintaining a neat appearance to the plant. The wintergreen fronds reach 20cm in all subspecies with those of subsp. *quadrivalens* tending to curve sinuously, with many ascending fronds spreading closely to the wall surface. Its distribution in the county is widespread but never common with concentrations in the central north, over to the east and in the very south. Nowhere does it appear as freely as on the Flixborough barn wall.

Only one nineteenth century record exists for green spleenwort *Asplenium viride* from a church wall at Toynton St. Peter. This more delicately cascading species is readily distinguishable by its green rachides contrasting with the dark coppery brown of *A. trichomanes*.

Sharing as wide a distribution throughout Lincolnshire as hart's-tongue, wall rue *Asplenium ruta-muraria* also has some blank zones, most noticeably in the north and west, the central Wolds and the south east extending along the course of the River Witham. Where it does occur it tends to quickly consolidate. It is a small, tufted fern rarely producing fronds in excess of 10cm. These are irregularly bi-pinnate with between 3 and 5 pinnules on each pinna varying in form from rounded to diamond-shaped. The fronds are wintergreen supporting linear sori on their undersides which have toothed indusia. It tends to be



Wall rue

photo RS Key

restricted to base-rich substratum. Recent discoveries in the far north of the county at Alkborough, Thealby, Whitton and inevitably at Flixborough have helped fill in some of those blank northern 10km squares.

The final member of the extant Lincolnshire *Aspleniaceae* is also the rarest; rusty-back fern *Ceterach officinarum* (plate 6). At one of its only sites in the north of the county it appears with wall rue and rather unexpectedly is on the primary school yard wall in Alkborough. The children seem to have respected the plant despite it being in easy reach of their fingers. Its common name stems from the dense covering of reddish-brown small scales which clothe the underside of the fronds. Their initial colour is silvery-white. The scales overlap one another like roof tiles, projecting beyond the frond margins so that they form a fringe around the plant when viewed from above. The pinnate fronds usually reach 10-15cms and are divided into a number of broad, rounded, alternate lobes. Each lobe is attached by the whole of its base to the rachis and each base is connected between the lobes. In times of prolonged dry weather the fronds in roll as a measure of protection from further water loss. Providing rain returns in time the fronds unfurl and the fern recovers. In Lincolnshire rusty-back fern is confined to the mortar course in old walls. It has a scattered distribution with a concentration in the south-west of the county.

There is only one extant member of the *Woodsiaceae* in Lincolnshire; three other species, always rare in the county, now being extinct. Lady fern *Athyrium filix-femina* has a wide distribution throughout Lincolnshire, whilst never becoming common, tending to become less frequent towards the coast and is absent from much of the south-east of the county. It favours woodland, preferring the damper areas, and is often found in association with many of the *Dryopteris* species. Lady fern has a very delicate form with bi-pinnate and sometimes tri-pinnate fronds, reaching over a metre in length on mature specimens. They arise in an erect, shuttlecock-like manner from ascending, stout woody rhizomes. These frequently harbour the remains of the



Lady fern

photo I Weston

bases of old stipes, ageing examples developing clusters of closely packed crowns. Colonies can arise from the breaking away of individual crowns from these clusters. The stipe is sparsely clothed with soft, pale brown scales, and is usually at least quarter of the

length of the frond. The pale green pinnae taper to acute points whilst the pinnules are deeply cut into segments which are themselves finely toothed. The appearance is that of a very delicate dissection. Perhaps most diagnostic in separating it from ferns of similar form is the shape of the curved sori. This is usually J-shaped but can be more like a half-moon or even C-shaped. The sori are covered by an indusium of the same shape which is hinged along the inside leaving a free outer edge which can appear ragged.

The extinct Lincolnshire *Woodsiaceae* have all been absent for many years. There are two Victorian records of oak fern *Gymnocarpium dryopteris* from Belshaw and Scotter and was last recorded from Tattershall in 1957 but was extinct by 1960. Limestone fern *G. robertianum* has only been recorded once, back in 1892, from Horkstow, where it was suspected of having spread into a quarry from a nearby rockery. Brittle bladder-fern *Cystopteris fragilis* was last recorded from Spilsby cemetery in 1961, having disappeared from Salmonby church.

The *Dryopteridiaceae* is the largest indigenous family of true ferns and is also the family with the highest number of species in the county. It includes the majority of what are probably best described as familiar ferns. The first group includes the only family member to become extinct in Lincolnshire; holly fern *Polystichum lonchitis*, which appeared briefly on a railway viaduct near Scunthorpe.

The other shield-ferns are much more established in the county although neither of them could be described as common. Soft shield-fern *Polystichum setiferum* produces long (often over a metre), pale green fronds initially in a dense shuttlecock, but their flaccidity soon causes them to flatten. The pinnae have a delicate feathery outline owing to the distinctly stalked pinnules having a hair point at the apex of each of their lobes. Soft shield-fern is widely distributed throughout Lincolnshire but tends to be limited by its intolerance of drought. It prefers base-rich ground and is most frequent on the clays to the east of the Wolds. Recent mild winters have caused the fern to remain wintergreen but deeper frosts would see the fronds brown and wither.

As its name suggests, hard shield-fern *Polystichum aculeatum* has a much coarser, leathery texture. It has a deeper colour and is more fully wintergreen. Fewer, shorter (60cm) fronds tend to be produced and these are even more prone to be horizontally spreading. The pinnules are neither as distinctly stalked nor as deeply lobed, their margins being more serrated with an acute spine at their apices. This gives a prickly appearance as well as feel to the fern. It prefers areas of heavy rainfall hence its limited appearances in the county, but it still remains widespread if uncommon. North Lincolnshire seems favoured by the hard shield-fern with good examples at Normanby Dales, Roxton and Bradley Woods but it can also be discovered in the south, such as in Elsea Wood.

The *Dryopteris* group is often considered a difficult one, not made any simpler by their propensity to hybridise. Male fern *Dryopteris filix-mas* is Lincolnshire's most widely distributed fern, a testament to its ability to grow under a wide range of conditions and in a variety of habitats. It has been recorded from almost every 10km square, missing from just the odd partially complete coastal one. Male fern is robust, numerous fronds arising shuttlecock style from an ascending rhizome. They are initially mid-green but steadily mature to a deeper, shiny green. The stipe tends to be about a quarter the length of the frond and has a covering of pale brown scales which thin out along the rachis to become sparse by the upper half. Straight pinnae are held perpendicular to the rachis, their broad bases narrowing gradually. Toothed edged pinnules mostly touch one another at their bases, gradually narrowing to a rounded apex. The undersides of the pinnules of fertile

fronds bear two lines of conspicuous kidney-shaped sori. Each indusium changes from an initial pale green, through grey to eventually reddish-brown. It is more or less flat, having slightly up turned edges. As the rhizome rarely branches male fern tends to grow as an isolated individual rather than in clusters. This is usually the case in Lincolnshire woodlands where plants can be spaced widely apart. If, however, the fern colonises walls many much smaller individuals can be present. The



Male fern

photo RS Key

rhizome seems to have been considered the most efficacious part of the plant for use in folk medicine and magic. It has been used to expel tapeworms and tradition has it that if a sleeping person's eyelids were rubbed with the rhizome, on waking they would fall in love with the first person they met. Its fronds have also been used as bedding and fodder for livestock.

Less frequently recorded is golden-scaled male fern, being almost entirely absent from much of the south-east of the county. Debate is still active on the *Dryopteris affinis* complex and just how many subspecies there might be. All of this fern I have encountered in Lincolnshire would appear to be *D. affinis* subsp. *borreri*, (plate 7) the most widespread subspecies. This ought to be expected for the other generally recognised types, subsp. *affinis* and subsp. *cambrensis* tend to have a more upland, western and northern distribution. Very often identification of this challenging fern is achieved by a process of elimination, recognising more what the plant is not than what it is! Almost all county records, not surprisingly, remain non-committal to subspecies which is after all a relatively recent recognition. It offers a new challenge for recorders in the twenty-first century! Golden-scaled male fern is often more robust than male fern, with fronds that may reach 1.5m. It frequently has a tougher and more leathery texture and its generally shorter stipe is densely clothed in golden-brown shaggy scales. They begin to thin out halfway up the rachis. At the junction between rachis and pinna, best seen on the underside, is often a dark patch, sometimes spreading to blacken the pinna midrib base. (Lincolnshire examples are not to be relied upon for displaying this frequently cited feature!) The pinnules on subsp. *borreri* have truncated tips and appear as though trimmed with a pair of scissors. The indusium of each sorus tends to have flat margins.

The main differences between the subspecies might be abridged thus:-

	subsp <i>borreri</i>	subsp <i>affinis</i>	subsp <i>cambrensis</i>
Rhizome	Less tendency to branch - more likely to appear as scattered individuals.	Branch freely, building up massive old clumps and becoming gregarious.	Branch fairly freely building up large multi-crowned clumps.
Pinnules	Square, truncated tips.	Rounded tips.	Down turned margins, rounded tips.
Indusium	Margins relatively flat. Turn creamy white and become funnel shaped before shrivelling and only partly persisting.	Steel-grey when young maturing brown. Doughnut-shaped, margins remaining tucked under. Splitting radially and lifting slightly. Long persistent.	Doughnut-shaped when young, margins flatten and lift with maturity. Occasionally splits, most shrivel and shed with a few becoming persistent.

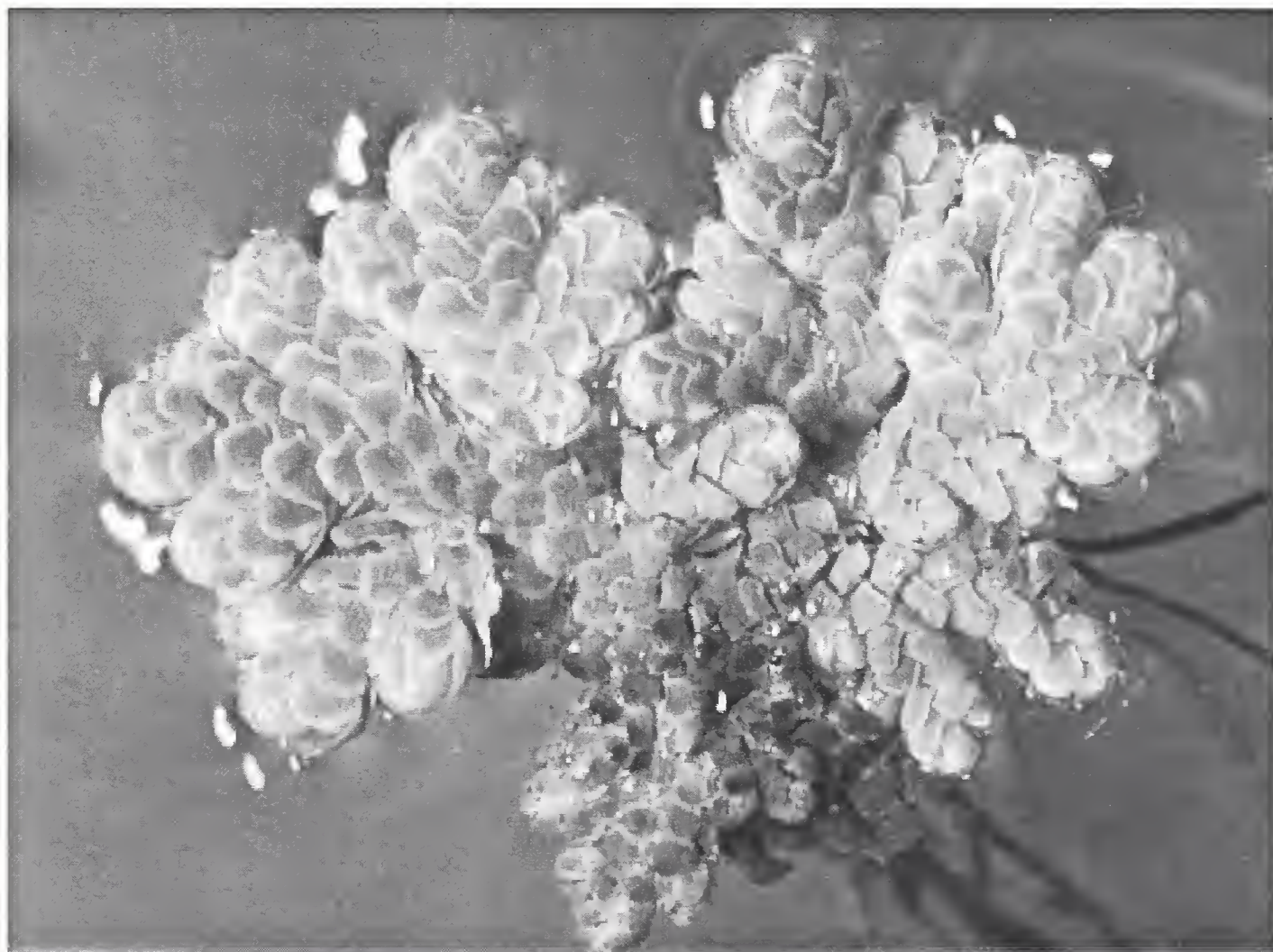
The remainder of the county *Dryopteridaceae* consists of the buckler-ferns and we are perhaps fortunate in Lincolnshire in only having to distinguish between two species and their hybrid. Narrow buckler-fern *Dryopteris carthusiana* is a medium sized, light green fern with narrow, erect fronds arising in sparse irregular groups and never in a shuttlecock-like crown. The lower half of the frond is parallel-sided which tapers gradually to a pointed apex. The bi-pinnate fronds have almost opposite pinnae with the basal sides of the lower pinnae noticeably larger. Reddish-brown stipes, of deeper colour towards their base, are sparsely clothed with uniformly pale tan, blunt scales. First frosts of winter causes a rapid die down. It is a fern of wet woodlands and fens and is very sensitive to changes in drainage. As a consequence it is not as frequent as it once was. It is commoner in the north of the county, thinning out through the Wolds and in the south. It is almost absent from the south-east.

Broad buckler-fern *Dryopteris dilatata* is another widely distributed fern that is also absent from the south-east fenland zone. It thrives in acidic woodland where it is often the commonest fern and can produce extensive colonies. The fronds arising from an erect rhizome can reach over a metre and take on a classic arching, shuttlecock-like form. They have a coarse texture, are deep green with an outline that ranges from broadly triangular to ovate depending on age and size. Some of the lower parts are tri-pinnate but the majority of the frond is bi-pinnate. The margins of the pinnules tend to curve downwards giving a convex appearance. An abundance of large, crisp scales clothe the stipes and these have characteristic pale margins with a central darker stripe. Sometimes this is so broad so as to give the scales a wholly dark brown appearance.

Dryopteris x deweveri is the hybrid between *D. carthusiana* and *D. dilatata* and typically inherits characteristics to varying degrees from both parents. It is more frequently encountered in acid woodland and I suspect it is under-recorded in Lincolnshire. It can be found in the absence of both parents, *D. carthusiana* in particular, as it is more tolerant of drier soil conditions. Indeed its sole presence can often signify a woodland whose character has been altered through drainage or other habitat disturbance. It produces much larger fronds than *D. carthusiana*, of a deeper green and a less delicate appearance. These are less likely to be erect despite the rachis being more robust, and are more abundantly covered in scales. Those on the stipe may have a shadow-like central darker strip, but not as distinct as those on *D. dilatata*. Its hybrid vigour can cause it to produce widespread colonies through extensive branching of their rhizomes, as can be found in Hartsholme Country Park and in Willingham Woods.

There is only one indigenous member of the *Blechnaceae* and it has a scattered distribution in Lincolnshire mainly confined to central and northern districts. Hard fern *Blechnum spicant* (plate 8) is a plant of acid soils found in woodland and heathland wherever the habitat remains damp. Two types of frond are produced; sterile ones forming a sort of flattened rosette and longer, erect, fertile ones arising from its centre. The sterile fronds are typically 50cm, leathery, pinnately divided and of a shining deep green colour. They are herringbone-like with oblong, blunt pinnae widest at their bases. The lowest pinnae are short, becoming longer at mid-frond creating a parallel outline, before tapering towards the tip. The rigid stipe is dark brown and much shorter than that of the fertile fronds, which otherwise have a similar structure. Their pinnae are more slender, acute and more widely spaced up the rachis. Each pinna bears a pair of linear sori either side of its midrib, with indusia that are attached to the pinna's outer edge. As the sori mature and bulge the pinnae begin to twist and curl. Whilst these fronds wither the sterile fronds remain wintergreen and may persist on the plant in a vegetative mass for a number of years. When the branching rhizome forms interconnecting crowns a mature specimen can become quite a feature of a habitat.

The final true fern is the only alien to be found naturalised in Lincolnshire. A member of the *Azollaceae*, water fern *Azolla filiculoides* has spread rapidly through the county's waterways and has become a nuisance in places. This floating fern can choke dykes and cover the surface of ponds to the detriment of other aquatic plants. A cavity on the underside contains nitrogen-fixing blue-green alga *Anabaena azollae* and infestation with this fern can lead to nutrient enrichment. The fern readily branches, the overlapping inflated fronds being covered in waxy particles, making the plant unsinkable. The light green fronds flush pinkish-red in the summer as the plant matures. The sori are located on the lower lobe of the first frond segment of each branch and are of two kinds; larger



Floating fern

photo I Weston

ones with several microsporangia and smaller ones with a single megasporangium containing a single megaspore.

Evocative, atmospheric, beautiful, dramatic, the ferns of Lincolnshire provide the county with an added dimension to its flora. However difficult the perception may be of identifying ferns the restricted Lincolnshire fern flora should encourage more dedicated effort in narrowing them down to species level. With relatively few tricky species in the county, confidence can be high. Hopefully the new century will see an increasing number of fern records contributed by recorders filled with a new found enthusiasm for these fascinating plants. There *are* more to found in Lincolnshire than just bracken!

Acknowledgements

I am indebted to Rene Weston for her help and advice during the production of this article. To Sara and Robyn I extend my gratitude for their understanding and patience during its research and composition!

Graeme Clayton is the Reserve Warden at Swanholme Lakes Local Nature Reserve. Born at Willingham by Stow he currently lives at Nettleham. In recent years he has become Lincs regional coordinator for the British Plant Gall Society and the LNU's plant gall recorder. He escapes from natural history by immersing himself in American beat literature.

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RECOVERY IN MOSSES & LIVERWORTS

Christine Rieser

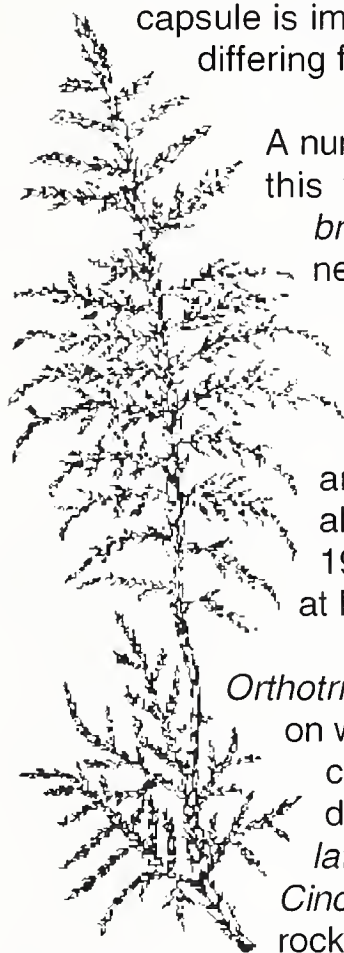
The reappearance of a highly pollution sensitive epiphytic moss after an absence of many years is news for celebration amongst all naturalists. It's presence indicates an improvement in air quality and in particular a reduction in sulphur dioxide concentration (Hill, Preston & Smith, 1994). *Cryphaea heteromalla* (illus. right) was recorded first in Lincs (VC 54) on an elder at Gibraltar Point in 1990 by a visiting bryologist Tom Blockeel (Perry, 1990). At that time it had not been seen for at least 50 years and the few existing records were much older, by Fowler in 1877 (Seaward, 1983). It had also



been absent from a large area in the industrial midlands where previous old records existed. It has now been recorded by our resident bryologists at two more positions at Gibraltar Point and at the following sites:

Friskney Decoy Wood. TF4657	20 Oct 1999
Burwell Wood TF3681	3 Mar 1999
Burton Pits SK9474	27 Oct 1999
Elsham Pit TA0313	14 Mar 1999
Well Vale TF4473	31 Oct 1999
S. Elkington pit TF3087	27 Nov 1999
Binbrook verge TF215923	8 Dec 1999

Cryphaea heteromalla is a very distinctive moss, growing most often on elder and catching the eye with the secondary shoots standing erect above the substrate. It is one of the pleurocarpous, pinnately branched mosses which produce their spore capsules laterally, usually above the branch on a long seta but in this species there is no seta and the capsule is immersed in sharply pointed perichaetial leaves with a hair point, so differing from the ovate leaves of the sterile branches.

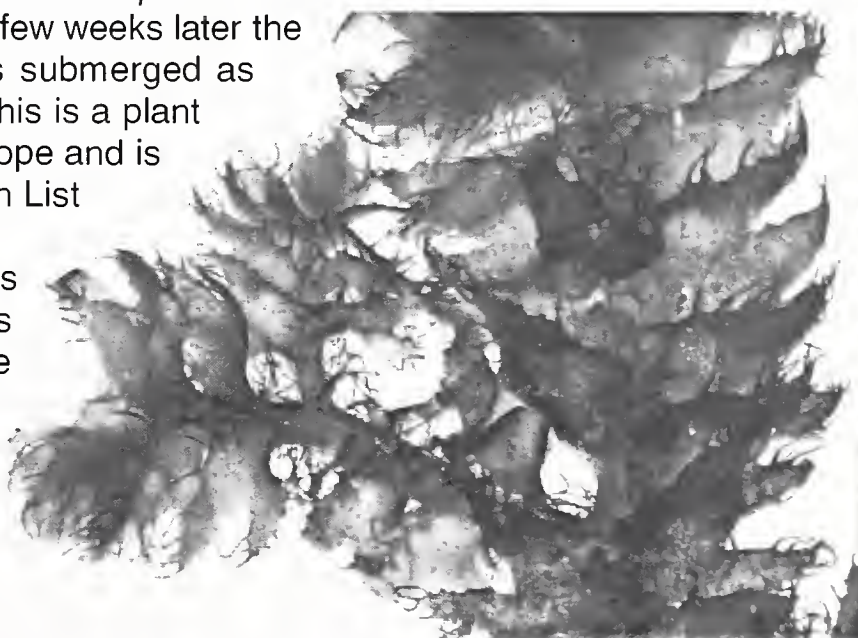


A number of other uncommon or rare mosses have also been recorded this year. perhaps the most interesting of these being *Hylocomium brevirostre* (illus. left) and *Orthotrichum sprucei*. Both of these were new records for vice county 54.

Hylocomium brevirostre is a big handsome branched moss, golden in colour with red stems and distinctively shaped leaves. It is usually found in shaded calcareous sites in the west of the country and has almost no records. old or recent in the eastern counties, although it was found in 1990 at Wicken Fen (Hill, Preston & Smith, 1994). It is growing now in some quantity on a chalk grassland bank at Binbrook.

Orthotrichum sprucei (plate 9) is a moss of the flood zone and was found on willow by the river at Tent Port on 25 Aug 1999. It was present in tiny clusters with the bright red lid of the capsule showing up against the dark green foliage amongst other mosses of the habitat, *Tortula latifolia*, *Leskea polycarpa* and *Orthotrichum diaphanum* with *Cinclidotus fontinaloides* present on rocks nearby. A few weeks later the whole area was submerged as the river had risen several feet. This is a plant which is rare nationally and in Europe and is on the UK Biodiversity Action Plan List

Lincolnshire is not renowned for its leafy liverworts but this year has seen the reappearance in some quantity of one of the most beautiful of these delicate moisture-loving plants. Usually found in the uplands of Wales. Northern England and Scotland, *Ptilidium ciliare* (illus. right) has this year been recorded at



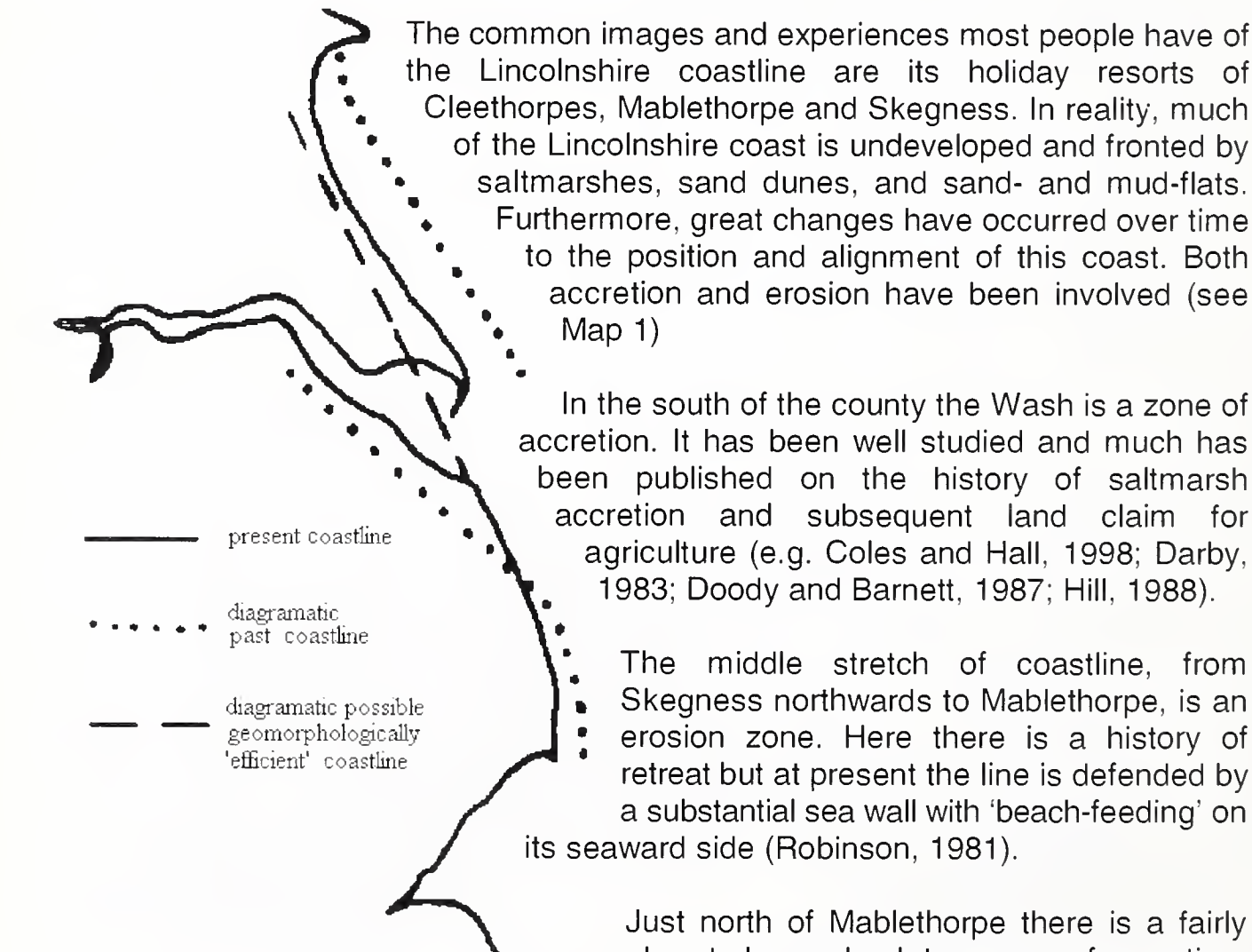
Ptilidium ciliare photo C Rieser

Kirkby Moor, Laughton Forest, Langholme Wood and Linwood Warren. This species was recorded in 1990 by Frank Lammiman at Twigmoor, but it had not been seen since until this year. Its close relation *Ptilidium pulcherrimum*, was found on ash in Skellingthorpe Wood in 1998 and was a first VC53 record. It has been found again this year in Cocklode Wood, the first record for over 50 years for VC54. A few other liverworts seem to have flourished this year, probably liking the wetter weather. *Lophozia ventricosa*, *Lepidozia reptans* and *Diplophyllum albicans* were found on a ditch bank at Walesby and *Radula complanata* on trees at Elkington Vale. There are 35 species of liverwort known to be here in Lincolnshire at present but with the rain we have had it may be worth looking for more.

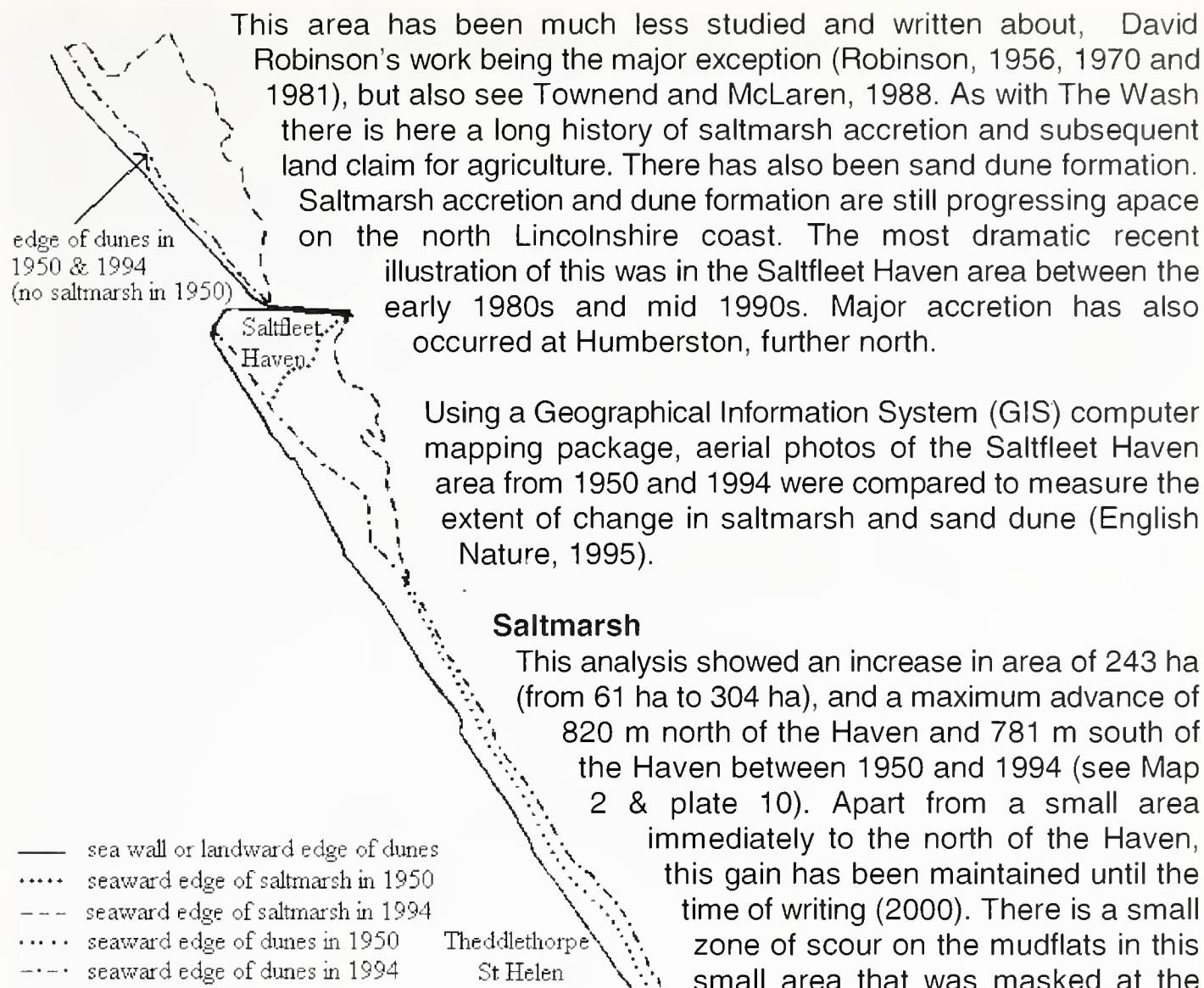
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RECENT SALTMARSH AND SAND DUNE EXPANSION ON THE NORTH LINCOLNSHIRE COAST

Graham Weaver



Map 1 Diagram of change on the Lincs & Holderness coasts



Map 2 Saltmarsh and dune accretion, 1950-1994



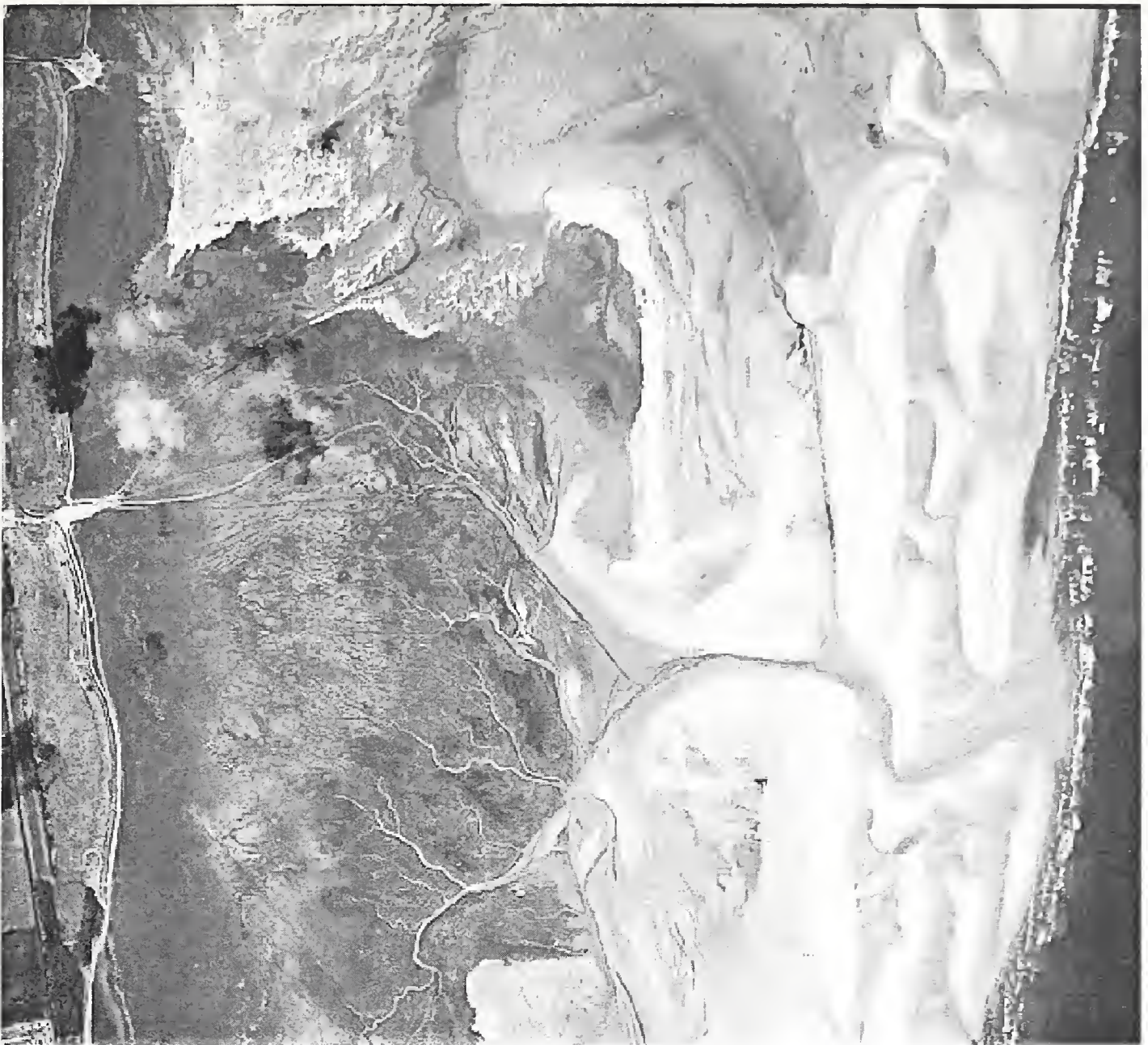
Foreshore north of Saltfleet Haven, April 1955, with no saltmarsh, © Crown Copyright/M.O.D.

this stretch of coast (Jones, 1988). This sediment could be coming from either the lower beach area due to beach steepening (see Burd, 1992 for Essex situation), or from outside the inshore area. Since the late 1980s the Environment Agency has been monitoring cross-beach profiles along this coast. I hope to publish an analysis of this data in a future article, in order to shed some light on this issue.

A distinctive element of the rapid saltmarsh formation was the development of creeks only *after* the vegetation cover had closed. A network of creeks progressively developed from water draining off the already formed marsh on each retreating tide. Furthermore common cord-grass *Spartina anglica* has played no role in the development of saltmarsh here

Sand dune

Analysis of the aerial photos also showed that between 1950 and 1994 there had been an increase of 48 ha in the area of dunes within the study area. Maximum dune advance of 128 m occurred towards the south of the area near Mablethorpe. In this latter area there is no saltmarsh in front of any of the dune ridges (see Map 2). Rather than one large dune ridge building up, a series of low ridges progressively develop parallel to each other and to the line of the coast. There are rarely low-lying, damp strips between. This is best seen along the Theddlethorpe stretch of coast.



The same area, July 1989, with large area of saltmarsh.
 © Cambridge University Collection of Air Photographs: copyright reserved

The small dunes formed on the beach barrier ridges are little different in vegetation composition from those developing at the toe of the main sandhills. Physically, though, their development differs. They are sometimes reworked by storm seas, whilst progressively each ridge with its low dune rolls landward by the movement of material from their seaward to their landward face. The speed and distance of this landward travel has not yet been mapped and measured.

A curious variation to this theme occurs at a dune ridge fronting saltmarsh to seaward of Rimac (Saltfleetby). Here, uncharacteristically, common cord-grass has been the initial dune-building grass. Elsewhere in the study area it only occurs around salt pans.

Acknowledgments

I would like to thank both David Robinson and Professor John Pethick for their stimulating and informative discussions over the years about the Lincolnshire coast. I would also like to thank English Nature for permission to use the GIS-generated data.

Graham Weaver is an independent ecologist and was formerly Site Manager of the Saltfleetby Theddlethorpe Dunes NNR on the Lincolnshire Coast.

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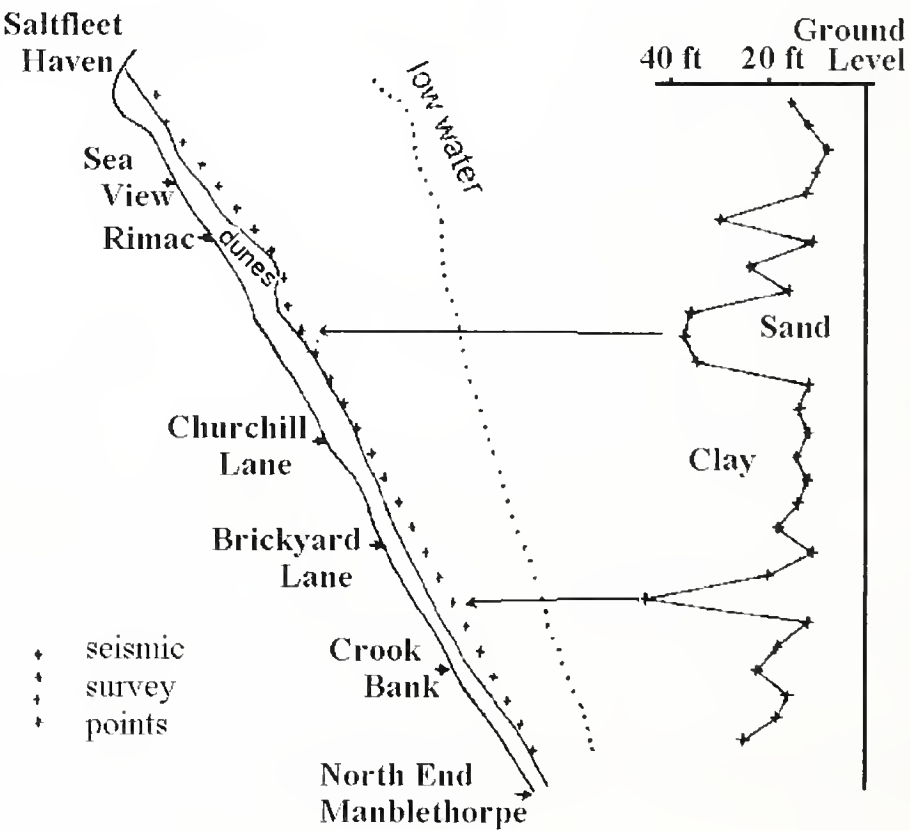
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HISTORICAL OUTFALLS OF THE RIVER GREAT EAU

Graham Weaver

The River Great Eau rises in the eastern Lincolnshire Wolds and flows across the coastal plain (the Lincolnshire Marsh) to its outfall via tidal sluice doors at Saltfleet Haven.

Its exit to the sea has not always been at Saltfleet Haven. During the early 14th century its course near the coast was diverted northwards to this Haven to increase the freshwater flushing effect in the Haven's channel. This major engineering effort was justified at the time as Saltfleet was a major port but was suffering from silting of its



sea channel (Owen, 1954; Platts, 1985). It appears that the river's former outfalls at Saltfleetby (Balack Haven) and Theddlethorpe (Wilgrip Haven) remained open, in reduced scale, until the 17th and 19th centuries respectively (Robinson, 1984).

In 1968 a seismic survey was undertaken along a length of the Lincolnshire coast, including the section where these havens had been (now on the Saltfleetby Theddlethorpe Dunes National Nature Reserve). This type of survey produces a profile of the rocks and sediments below ground level for geologists to interpret for possible oil- or gas-bearing strata. Looking at the diagram, there are two clear depressions in the near-surface marine clays in the general area of these now disappeared havens. These are likely to be the now buried outfall channels of these former havens. The outfall at Balack Haven appears to have been less stable, or more braided, than that at Wilgrip Haven, with the former showing up on the profile diagram as three channels of varying depth and width.

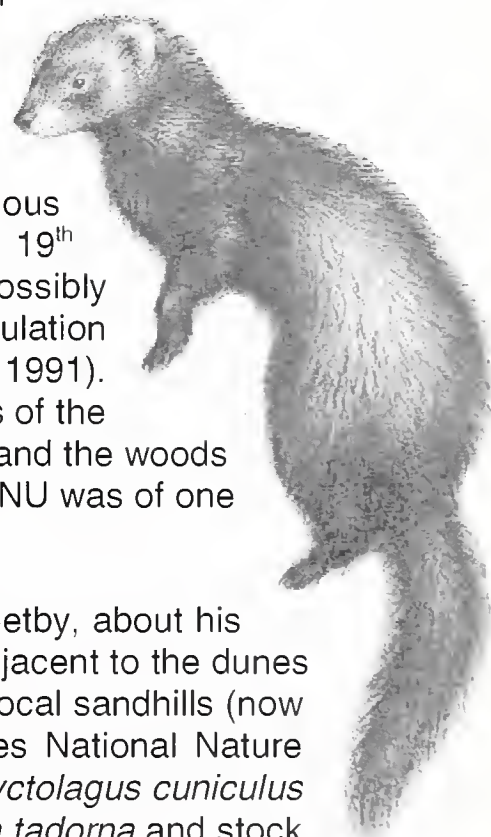
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A LATE RECORD FOR POLECAT *MUSTELA PUTORIUS* IN LINCOLNSHIRE

Graham Weaver

The changing fortunes of the polecat *Mustela putorius* in Britain mirror those of a number of other predators that have been perceived as conflicting with shooting interests in the past. Although it is now spreading back into England from its Welsh sanctuary (Birks, 1993), it has been absent from England for much of this century. "Despite various pressures, continued to maintain itself until middle of 19th century, when numbers fell and range reduced.....Few possibly survived in isolated parts of England until 1930s. Population minimum probably reached 1915"(Corbet and Harris, 1991). Closer to home "...it was formerly common in many parts of the county, especially the Bardney woodlands, the Outmarsh and the woods around Louth. The last record in the Transactions of the LNU was of one near Bardney in 1926" (Johnson, 1982).



In conversation with Mr H Liller, now a resident of Saltfleetby, about his childhood times in the 1920s and 1930s at Gowt's Farm adjacent to the dunes at Saltfleetby, he described to me what it was like in the local sandhills (now the northern part of the Saltfleetby Theddlethorpe Dunes National Nature Reserve). Apart from the very large numbers of rabbits *Oryctolagus cuniculus* (making stock grazing pointless), with shelducks *Tadorna tadorna* and stock doves *Columba oenas* breeding down their holes, he also mentioned the presence of 'foulmartins' also inhabiting the burrows.

Checking in Corbet and Harris (1991) this name is only used for polecat, not for any of the other mustelids. Mr Liller's description of these animals (last seen personally by him in 1930) also conforms with polecat. Habitat and likely food supply agree with information in Corbet and Harris (1991). Sand dunes, rabbit burrows and rabbits are stated to be significant for polecats. Interestingly, this source also comments that polecats are found "generally in thinly populated areas". It is difficult for people of a younger generation (like me!) to appreciate how wild and remote this part of the Lincolnshire coast was up to the 1930s. A final corroboration of this animal's identity comes from the local dialect word used by the older locals in discussing this animal with Mr Liller in the 1920s/1930s. The word was *fummard* which local glossaries translate as polecat (eg Good, 1986 reprint).

In 1932 the then Air Ministry purchased these sandhills making access for Mr Liller and other locals more difficult. However people still spoke to Mr Liller of foulmartins/fummards in the sandhills throughout the 1930s. Mr Liller moved away from the area in 1939.

It is probably fruitless to speculate just how long polecats did survive on the Lincolnshire coast. Was it the coming of holidaymakers in ever larger numbers from the mid-1930s, or was it not until the infamous collapse of the rabbit population in the mid-1950s due to myxomatosis that polecats were finally forced into extinction here?

Now that rabbits have returned in reasonable numbers, perhaps we may welcome back the polecat before too long in Lincolnshire (as has happened with the buzzard *Buteo buteo*). Road casualties and game keepers traps are important sources of information for charting the current spread of this species (Birks, 1993).

An interesting tailpiece is Mr Liller's comment that natterjack toads *Bufo calamita* were "easy to find" and "in numbers" during this period on the dunes. The extensive areas of tightly grazed rabbit turf were no doubt much to their liking.

Acknowledgements

I would like to thank Mr Liller for sharing his recollections with me and for agreeing to this note being published.

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LINCOLNSHIRE NATURAL HISTORY IN 1999

The run of unusual weather, with various sunshine or rainfall records again being broken. has continued, prompting comments about global warming and climate change. Ken Rowland reported it to be the wettest year since 1986 when he started to keep records; nearly 32" of rain, against an average of 21". January, February and March were all very mild and very wet with only a few frosts, with a very warm false spring towards the end of March, followed by a very brief period of sharp frosts and blizzards in the west of the

county in the early part of the April, which was otherwise typically showery and with a very warm spell around Easter. May to August were cool and very wet, with only a couple of short warm spells in May and the 3rd week of June. By the 18th, August had become the wettest on record and continued to the end of the month, giving way to pleasant 'Indian' summer from September through to November which turned out to be the sunniest on record. The first air frost did not come until the 1st week of December, which otherwise was wet and windy.

Acknowledgments of Records

As always, the county recorders have acknowledged a debt of gratitude to all who have taken the time and effort, very considerable in some cases, to submit records. There are so many who send in records of different groups of animals and plants that individual recorders are now acknowledged together to avoid duplication: A & A Binding, K Bradshaw, D Bromwich, C Cheffins, G Clayton, P Cook, BJ Cunnington, A Dale, T Davey, J Davison, W G Earnshaw, I Farmer, S Farrow, J Francis, MA&R Frankum, A & C Faulkner, R Gibbons, OL Gilbert, A Godfrey, N Goom, S Green, Z Harris, C Harrison, D Harrison, KK Harrison, P Haywood, B Hedley, R&K Heath, B Hedley, M Hill, B Hirst, NG Hodgetts W G Hoff, C Hutchinson, R Jefferson, M Johnson, RW&A Johnson, R & R Key, L King, P King, P Kirby, J Kneeshaw, D Knight, V Knight, J Lamin, N Lammings, FR Lammiman, A Lazenby, R Lucas, R Nickerson, D Maxfield, G McMichael, A McGovern, J Mears, W Meek, P Nichols, J Ostler, M Overton, A Parker, P Phillips, N Pike, M & I Pool, P Porter, R Race, B Redman, EJ Redshaw, C Rieser, K&W Robertson, K Rowland, N Sanderson G Steele, C Smith, G Taylor, T Smith, J & J Stobart, K Stephenson, J Shackles, N Tribe, N Turnbull, M Tyszka, B Van den Bos, B Watkinson, G & C Weaver, I Weston, W Weston, V Wilkin, K Wilson, E Woods.

FUNGI - Ken Rowland

Looking at the records for the year my observation would suggest that sites on heavy clay soils only produced about 50% of species, whilst sites on sand or well drained soils produced 100% or more of the expected number. It was also noticeable that many species, especially in *Russula* and *Lactarius* did not show in very large numbers. Records from other LNU members have come in relatively late, so I have not yet had time to enter or analyse them, so some of my observations may need modifying later.

The LNU meeting at Callan's Lane Wood in April turned up 24 species, including 3 new site records and one new county record of the jelly fungus *Exidia truncata*, not too bad a list for an April meeting. At the Stapleford Wood meeting in June. 19 species were recorded with nothing really unusual except *Peziza succosa* a dark brown cup



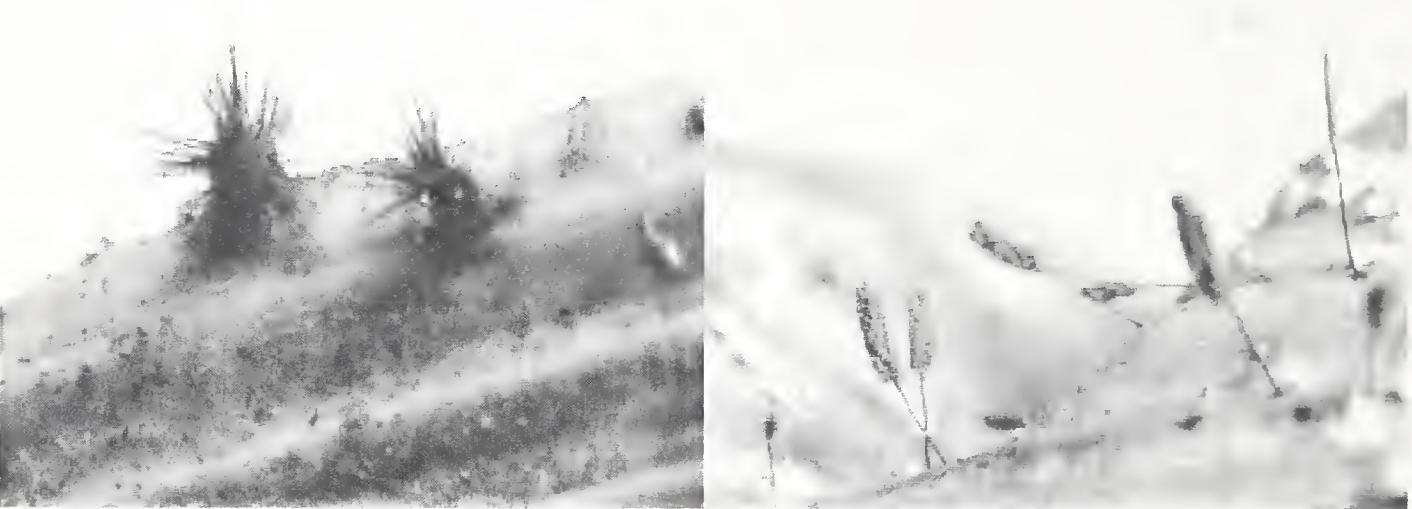
Cup fungus *Peziza succosa* at Stapleford Wood

photo Ken Rowland

fungus on bare soil on the side of a ride. Colin Faulkner sent me 9 records from the Grimsthorpe Park meeting in July, the most interesting being the Ergot *Claviceps purpurea* on grasses.

The Presidents meeting at Swanholme in August turned up 31 species, not a lot for the site but it included a new county record of *Octospora melina* (plate 11), a small orange red cup fungus in moss. In afternoon at Hartsholme I could not participate but, at a foray I lead two weeks later, 89 species were found.

The annual fungus foray in October was at Langholme Wood which turned out to be a wonderful fungus site and the weather conditions were good. Altogether a list of 101 species was collected including 22 new site records and a new county record *Colletotrichum dematium*. I am not surprised it hasn't been recorded before as a very strong magnifier is needed even to see it. This turned up on an old nettle root passed to me by Roger Key with the words "There are some little black dots on this must be one of yours." The black dots I did not identify, but there was *C. demetium* together with *Stysanus*



Microfungi on old nettle roots at Langholme Wood: left *Colletotrichum dematium*(new to county) right *Stysanus stemonitis* photos Ken Rowland



Pholiota squarrosa at Langholme Wood photo Ken Rowland

stemonitis, another minute fungus. One of the most outstanding spectacles was a large group of *Pholiota squarrosa* at the base of a large willow clump, found by Frank Lammiman.

All in all probably not the best of years, although with a large number of new site records as under-worked sites were visited, but with about ten or twelve new county records.



Plate 1 Great horsetail *Equisetum telmateia* (page 7) occurs on lime-rich seepages along the edge of the Wolds.

photo Roger Key



Plate 2 Royal fern *Osmunda regalis* (page 9) is naturalising at Hartsholme and Swanholme.

photo Irene Weston



Plate 3 Pillwort *Pilularia globulifera* (page 10) is an internationally rare fern and is listed on the UK Biodiversity Action Plan.

photo Irene Weston



Plate 4 Uncurling golden-scaled bracken frond *Pteridium aquilinum* (page 11), probably the commonest fern in the world.

photo Irene Weston



Plate 5 Mountain or lemon-scented fern *Oreopteris limbosperma* (page 12) is now a rare plant of acid soils near Woodhall.

photo Irene Weston



Plate 6 Rusty-back fern *Ceterach officinarum* (page 15) occurs mainly on mortar in old walls in south west Lincolnshire.

photo Graeme Clayton



Plate 7 Golden-scaled male fern *Dryopteris affinis* subsp. *borreri* (page 17) is typified by golden brown scales under the stipe. photo Irene Weston



Plate 8 Hard fern *Blechnum spicant* (page 19) with separate fertile & sterile fronds, occurs on damp acid soil. photo Irene Eston

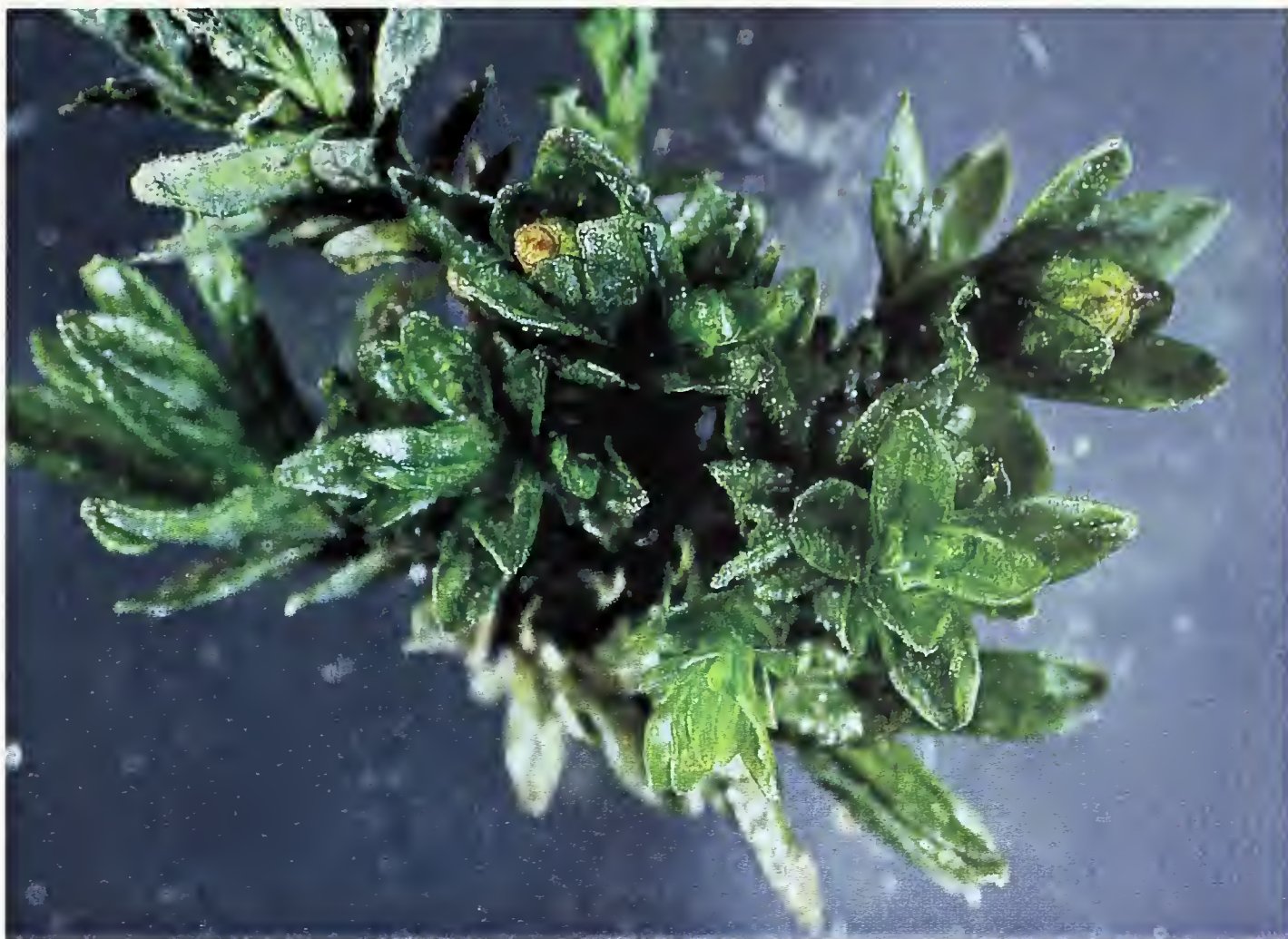


Plate 9 The moss *Orthotrichum sprucei*, (page 17) is on the European Red Data Book and UK Biodiversity Action Plan.

photo Christine Rieser



Plate 10 Saltmarsh expansion at Saltfleetby Theddlethorpe photographed 1992 (page 23).

photo Graham Weaver



Plate 11 A small orange red cup fungus *Octospora melina* new to Lincs in August 1999 from the LNU meeting at Swanholme. photo Ken Rowland



Plate 12 Herb Paris *Paris quadrifolia* in Cocklode Wood, rediscovered after nearly thirty years (page 44). photo Zella Harris



Plate 13 A superb showing of cornflower *Centaurea cyanus* over six acres of arable land near Thrurlby Wood (page 44). photo Irene Weston



Plate 14 The chafer *Omaloplia ruficollis* was found new to Lincs on the LNU meeting at High Dyke in June. (page 50). photo Roger Key



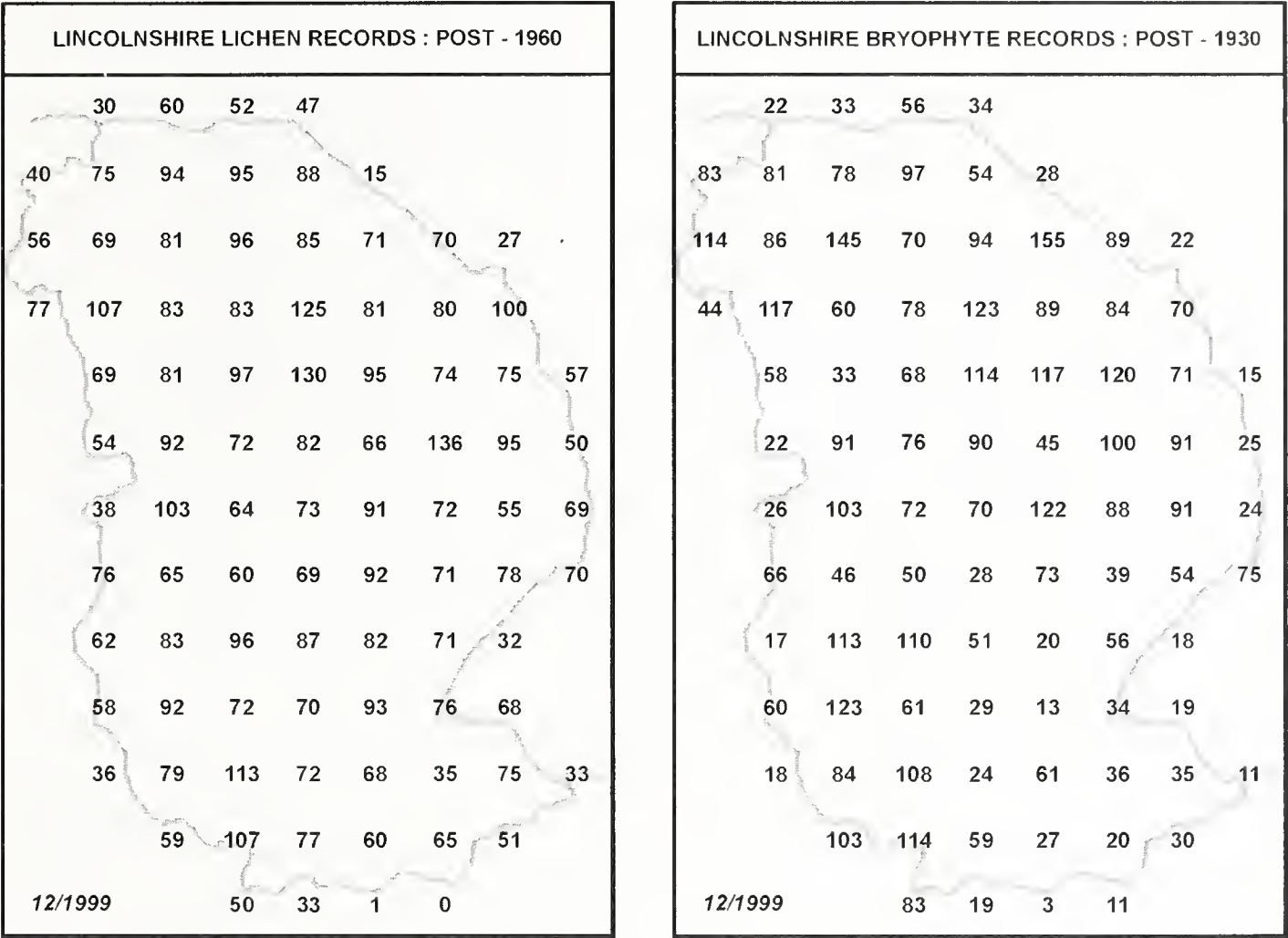
Plate 15 The micro-moth *Anania funebris* turned up new to Lincolnshire photo Roger Key at Twyford Wood on National Moth Night on 17th July (page 53).



Plate 16 The shelled slug *Testacella scutulum* was found at Alford in October, the first record since 1920 - note tiny shell on left. photo Roger Key

MOSSES, LIVERWORTS AND LICHENS - Mark Seaward

Mainly due to the invaluable work of Nick Hodgetts, Frank Lammiman, Christine Rieser and Neil Sanderson, numerous bryophyte records were added to our registers; their most notable finds included three new county records, namely *Herzogiella seligeri*, *Hypnum imponens* and *Orthotrichum sprucei*, and four new vice-county records, namely *Amblystegium tenax*, *Bryum dunense*, *B. gemmiferum* and *Cryphaea heteromalla*. As can be seen from Table 1, although only four taxa have been discovered for the first time in



the county over the past decade, 38 have been rediscovered. Although the latter has, to a large extent, been due to the diligent activity of the above-mentioned bryologists, undoubtedly environmental improvement in recent years (e.g. habitat management and atmospheric amelioration) has favoured bryophyte recovery. Of particular interest in this respect is the return of a much more diverse epiphytic flora. A species-poor flora of 30 to 40 years ago was marginally improved over the next two decades by the spread over the county of aggressive species such as *Orthodontium lineare* and *Dicanoweisia cirrata*; however, more recently, elements of the original flora not seen for more than 75 years, such as *Cryphaea heteromalla* and species of *Orthotrichum*, *Ulota* and *Zygodon*, together with several species of hepatics, are on the increase.

Another notable find during the year was the rediscovery of *Dicranum majus* at Linwood Warren by Frank Lammiman and Christine Rieser in January, the first record of the species for the county since 1912; rather interestingly, in February it was found at Hardy Gang Wood by Tim Smith (Smith, 1999), and at a third site, Laughton Forest, in December by Paul Kirby.

Further lichenological work was undertaken in 1999 as part of the British Lichen Society's churchyard survey: in all, a further 38 churches were investigated by the author, making

a total of 272 Lincolnshire churches which have been surveyed to date. The LNU Fungus Foray at Langholme proved most interesting from a lichenological point of view, the patches of lowland heath occasionally supporting a rich terricolous flora including several *Cladonia* spp. and *Coelocaulon aculeatum*.

Table 1. Analysis of Lincolnshire bryophyte flora: number of taxa in 1989 and 1999

	Liverworts		Mosses		Total	
	1989	1999	1989	1999	1989	1999
Extant	42	50	221	275	263	325
Not seen for 50+ years	17	13	82	34	99	47
Not seen for 100+ years	3	3	10	9	13	12
Possible*	4	2	4	3	8	5
Total	66	68	317	321	383	389
Doubtful*	2	2	3	3	5	5
Total	68	70	320	324	387	394

* Records not supported by herbarium material

In the light of recent lichenological work, one new county record (*Lecania turicensis*), two new vice-county 53 records (*Caloplaca crenulatella* & *Collema fuscovirens*), 73 divisional records and many grid square records have been added to our registers. The figure shows the level of lichen recording in the county since 1960 on a 10 km x 10 km grid square basis: in all, there are 6416 records with an average of 71 per square, which are approximately double the totals which had been achieved only a decade ago. Bearing in mind that certain county boundary and coastal squares are inherently poor, mainly due to their size and, although a few squares are undoubtedly under-recorded, most of Lincolnshire has been reasonably covered (perhaps VC 54 better than VC53).

The following bryophyte records were contributed N.G. Hodgetts (NGH), F.R. Lammiman (FRL) and C. Rieser (CR) and lichen records by the author unless otherwise stated.

Mosses

Amblystegium tenax (Hedw.) CEO Jensen +15 NGH;
VCR
Barbula hornschurchiana Schultz +9 NGH 1998
Bryum dunense Smith & Whitehouse +9 NGH 1998;
VCR
B. gemmiferum Wilcz. & Demar. +3 FRL CR, 6 FRL CR, 8 FRL & CR, 9 NGH 1998 **VCR**, 12 FRL CR
B.pallens Sw. +11 NGH 1998
Calliergon giganteum (Schimp.) Kindb. +9 T Smith
Cryphaea heteromalla (Hedw.) DMohr +8 FRL CR, 9 NGH 1998, 15 NGH; **VCR**
Dicranoweisia cirrata (Hedw.) Lindb.ex Milde +12 NGH 1998
Dicranum majus Sm. +5 P Kirby, 7 FRL CR; first record for the county since 1912
Eurhynchium swartzii (Turn.) Curn. +12 NGH 1998
Fissidens crassipes Wils. ex Br.Eur. +2 FRL CR
Herzogiella seligeri (Brid.) Iwats. +12 NGH 1998 **NCR**
Hylocomium brevirostre (Brid.) Br.Eur. +8 FRL CR; first record for the county since 1904
Hypnum imponens Hedw. +2 NASanderson 1997 **NCR**
H. jutlandicum Holmen & Warncke +12 NGH 1998
H. resupinatum Taylor +12 NGH 1998
Orthotrichum diaphanum Brid. +12 NGH 1998
O. lyellii Hook. & Tayl. +3 FRL CR
O. pulchellum Brunton +12 NGH 1996
O sprucei Mont. +6 FRL CR **NCR**

Plagiothecium curvifolium Schlieph.ex Limpr. +12 NGH 1998
Pogonatum aloides (Hedw.) PBeauv. +1 FRL CR; first record since 1928
Polytrichum piliferum Hedw. +11 NGH 1998
Pottia heimii (Hedw.) Fűrnr. +2 FRL CR
Ulota crispa (Hedw.) Brid. +8 FRL CR, 12 FRL CR
U. phyllantha Brid. +8 1998, 12, 14 1998 all FRL CR
Zygodon conoideus (Dicks.) Hook. & Taylor +9 NGH 1998, 12 NGH 1998
Liverworts
Chiloscyphus pallescens (Ehrh. ex Hoffm.) Dum. +4 FRL CR
Lophocolea heterophylla (Schrad.) Dum. +12 NGH 1998
Metzgeria fruticulosa (Dicks.) Evans +12 NGH 1998
Ptilidium ciliare (L.) Hampe +1 MRD Seaward
P. pulcherrimum (G.Web.) Vainio +7 FRL CR
Radula complanata (L.) Dum. +8 FRL CR
Riccardia chamedryfolia (With.) Grolle +5 FRL CR, 7 FRL CR, 9 NGH 1998
Lichens
Acarospora rufescens (Ach.) Krempelh. +14, 15
Agonimia tristicula (Nyl.) Zahlbr. +13
Aspicilia subcircinata (Nyl.) Coppins +15
Bacidia sabuletorum (Schreber) Lettau +4
Buellia aethalea (Ach.) Th.Fr. +4
B. griseovirens (Turner & Borrer ex Sm.) Almb. +2
Caloplaca crenulatella (Nyl.) HOLivier +13 OLGilbert,

Metheringham **VCR**

C. flavovirescens (Wulfen) Dalla Torre & Sarnth. +2, 4

C. isidiigera Vezda +8

Catillaria chalybeia (Borrer) Massal. +3, 13 O.L.Gilbert

Cetraria chlorophylla (Willd.) Vainio +4

Chaenotheca ferruginea (Turner ex Ach.) Mig. +13

Cladonia arbuscula (Wallr.) Flot. +1

C. gracilis (L.) Willd. +2

C. ramulosa (With.) Laundon +2

C. subulata (L.) Weber ex Wigg.+1,2 NASanderson 1997

Clauzadea monticola (Ach.) Hafellner & Bellem. +16

Coelocaulon aculeatum (Schreber) Link +1

Collema crispum (Huds.) Weber ex Wigg. +14

C. fuscovirens (With.) Laundon +15 Barrowby **VCR**

C. tenax (Sw.) Ach. +13

C. tenax var. *ceranoides* (Borrer) Degel. +2, 3

Haematomma ochroleucum var. *porphyrium* (Pers.) Laundon +14, 16

Hypogymnia tubulosa (Schaerer) Havaas +4

Lecania inundata (Hepp ex Körber) M.Mayrhofer +13

Caythorpe, mortar joints of brick wall **NCR**

L. turicensis (Hepp) Müll.Arg. +16

Lecanora pannonica Szat. +8, 13, 14

L. soralifera (Suza) Räsänen +14

L. sulphurea (Hoffm.) Ach. +4, 14

Lecidella elaeochroma (Ach.) M.Choisy +1

Lepraria lobificans Nyl. +5

Micarea lignaria (Ach.) Hedl. +1, 4

M. prasina Fr. +1, 13

Mycoblastus sterilis Coppins & PJames +4

Opegrapha saxatilis auct. +15

Parmelia glabratula (Lamy) Nyl. +1, 2, 4, 14

P. glabratula ssp. *fuliginosa* (Fr ex Duby) Laundon +5

P. mougeotii Schaerer ex DDietr. +13

P. subaurifera Nyl. +4

P. subrudecta Nyl. +13

Phaeophyscia nigricans (Flörke) Moberg +7

Placynthiella icmalea (Ach.) Coppins&PJames +1,2, 4

Placynthium nigrum (Huds.) Gray +4

Platismatia glauca (L.) Culb. & C.Culb. +4

Porpidia soredizodes (Lamy ex Nyl.) Hertel +8

Pseudevernia furfuracea (L.) Zopf. +4

Psilolechia leprosa Coppins & Purvis +7

Rinodina exigua Gray +1

Scoliciosporum chlorococcum (Graewe ex Stenhammar) Vezda +1

Solenopsora candicans (Dickson) Steiner +16

Trapelia involuta (Taylor) Hertel +13

T. placodioides Coppins & P.James +1, 15, 16

Trapeliopsis flexuosa (Fr.) Coppins & PJames +1, 2

NA Sanderson 1997

T. granulosa (Hoffm.) Lumbsch +4

Verrucaria macrostoma Dufour ex DC. +13, 15

Xanthoria polycarpa (Hoffm.) Th.Fr. ex Rieber +1, 14

Reference

SMITH, T. 1999. The moss *Dicranum majus* Sm. refound in Lincolnshire. *The Lincolnshire Naturalist* **24**: 227-228

BOTANICAL REPORT - Irene Weston

The Botanical Society of the British Isles Atlas 2000 recording project dominated activities in 1999. Records up to 1 November 1999 were compiled and submitted to Monks Wood. Many members of the LNU sent in records for 1999 and the West Norfolk botanists “came across” to the adjoining squares as they had finished their recording for the Norfolk Flora. I am very conscious of the fact that there are still many gaps in the Atlas records because of under-recording due to the sheer size of the county. We have also lost habitat and hence species from individual squares. For example, in SK98, a very familiar square adjacent to Riseholme, Miss E J Gibbons and Roger Hull recorded in 1948 *Platanthera bifolia* and EJG in 1954 *Eleocharis quinqueflora*, *Eriophorum angustifolium*, *Pedicularis palustris*, *P. sylvatica*, *Blysmus compressus*, *Carex distans*, *Triglochin palustris* and *Isolepis setacea* - all from one boggy field. This was drained in the 60’s and these plants are no longer recorded for the square, despite searches in the 60’s, 70’s and more recently. So rare were these plants in the square that the drainage of even a small area altered the square profile.

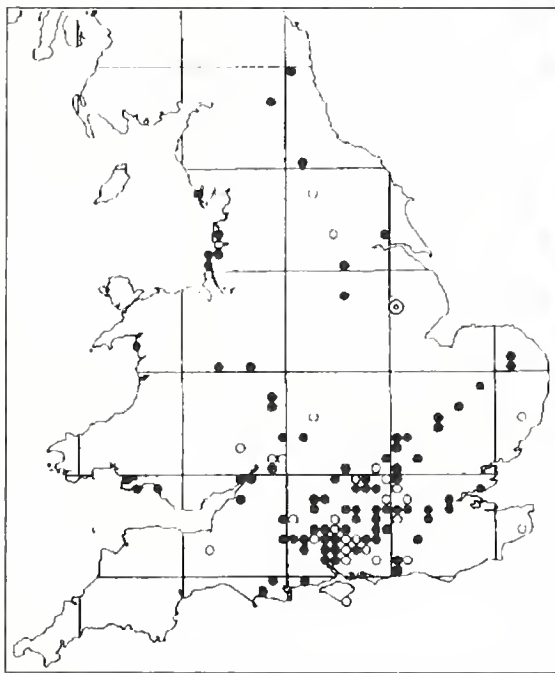
Navelwort or wall pennywort *Umbilicus rupestris*

I recorded this plant with Graeme Clayton in the Butchers Arms Car Park at West Halton, growing on a wall where polypody was abundant, it was reminiscent of walls in the west where it grows in association with abundant ferns. Six plants were found, three in flower. Previously regarded as a rare introduction in Lincolnshire, this record is an enigma. Questionably native in this more moist area near the Humber, one cannot imagine it

introduced here. Previous records are at Tattershall Castle in 1727 by Blair, in 1961 by S Monk, in 1986 by T Smith & H Drewitt and I found it flourishing there in 1999 and at Tealby in 1877 by Lees, all introduced.

Green flowered helleborine *Epipactis phyllanthos*

Three flowering spikes of this Nationally Scarce plant were found under beech at Hartsholme Park in 1999 by Rachel Tankard. It was subsequently confirmed by myself and the BSBI *Epipactis* referee Dr J Richards, from three florets



Green flowered helleborine after Richards in Stewart et al., 1994



Wall pennywort

photo I Weston

pickled in gin (!) sent by Graeme Clayton. Populations of this species fluctuate markedly in size – disappear from well-known sites and appear in totally new areas in a most unpredictable manner (Richards in Stewart et al., 1994). This species is new for Lincolnshire; a remarkable find.

Yellow flowered form of the bee orchid *Ophrys apifera* var *chlorantha*

This scarce form of the bee orchid was found new for VC54 in 1999 at Ferriby Cliff Quarry TA02 by Mr M Broadbridge. It is only rarely recorded in Lincolnshire and was seen by Mr Malcolm Pool in VC53 in 1998.

The Ancaster thrift *Armeria maritima* var *elongata*

This British Red Data Plant was recorded in 1999 at a new site at in Wilsford TF04 (IW, PK, ZH, VW). This makes the second 10 km square for the species in Great Britain at the present time, the other being in SK94 at Ancaster. The history of this species was written up in 1958 by Gibbons & Lousley (1958) after a thorough investigation of its distribution in the Ancaster area. I quote the summary in the article.

“An inland *Armeria* has been known to grow in Lincolnshire since 1726 and in adjoining parts of Leicestershire since a little later. The old records are reviewed and the twelve stations where the plant was studied in 1956 are described and discussed. It is shown that this non-maritime *Armeria* is distinguishable from *A. maritima* (Mill) Willd subsp. *maritima* on morphological, geographical and ecological characteristics and it is therefore best

treated as a subspecies *A. maritima subsp. elongata* (Hoffman) Bonnier based on *Statice elongata* Hoffman." Pultney's records from 1757 indicate that the plant was much more widespread over the Lincoln Heath and that an *Armeria* was abundant around Grantham and Sleaford. The map in the article shows the locations distributed over six 10 km squares in 1956 including TF04 but the 1999 plants – two flowering clumps were in a completely new site from those described in 1956." See also Goulding (1896) for additional information.

Smooth rupturewort *Herniaria glabra*

A new site has been found for this national Red Data Book species Woodlands Park in SK94 by myself and Zella Harris in the car park adjacent to one of the lakes. Known currently from Wilsford Warren and Rauceby in TF04, this finding has again extended the known distribution to two 10 km squares. It has been recorded previously in SK94, at Ancaster in 1900 by RW Goulding and at West Willoughby in 1894 by CS Stow, 1969 JH Chandler. This new site is located between these areas. We also recorded from the same site a dozen or so plants of yellow bartsia *Parentucellia viscosa*, semi-parasitic on grasses. Listed only once before in Lincolnshire as a casual in grass seed on the sea bank at Wainfleet in 1957 by P & J Hall, it is believed that this might also have come in with grass seed for reseeding areas around the lake at Woodlands. It has been recorded in Great Britain recently in a number of localities as a grass seed impurity (corresp. with Dr C Preston, Monks Wood).



Yellow bartsia

photo I Weston

A new grass - *Bromus hordeaceus longipedicellatus*

This was recorded from VC54 near Brocklesby in 1999 by P Cook and confirmed by the referee L M Spalton, Botanical Recorder for North Devon. The new taxon was reported by Spalton (1999). It resembles a very large *Bromus hordeaceus*. We have been asked to look out for it in VC53. It is found in disturbed ground usually on road verges and banks or in the gateways and edges of arable fields especially wheat fields and bulb fields.

Also confirmed from North Lincolnshire VC54 by L Spalton were *Bromus secalinus* and *Anisantha diandra* TF38 Grimoldby, cereal field (IW, PK). We have also had many records this year of *Agrostis gigantea* giant or black bent formerly regarded as being scarce in the County. Plentiful in the Market Rasen area in cornfields and set-aside.

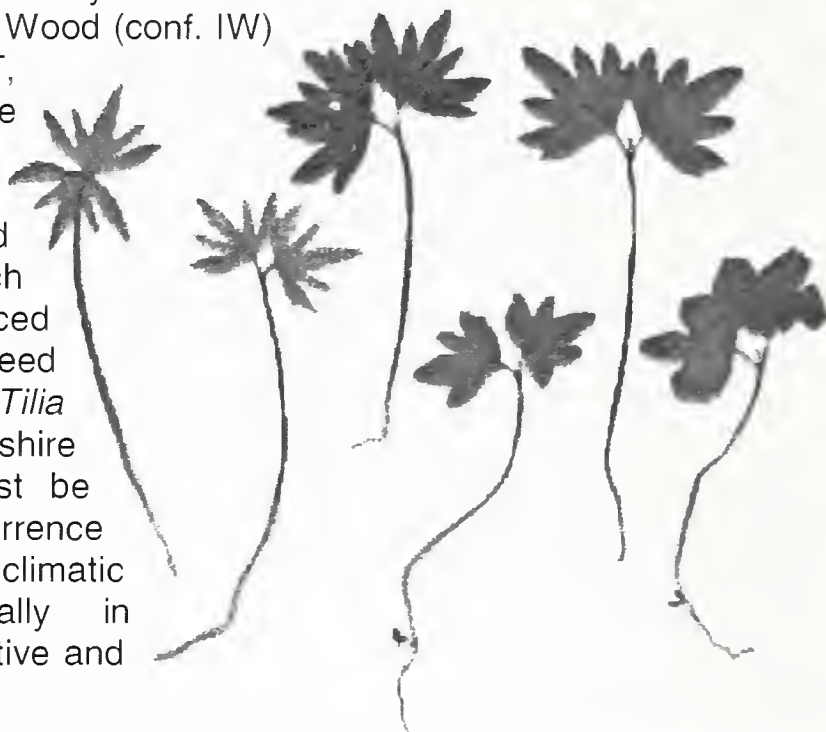
Herb Paris *Paris quadrifolia* (plate 12)

As a result of information from a 1970 bird survey by Miss Nora Goom, we were able to refind a population of *Paris quadrifolia* at Cocklode Wood in TF17. Plants were found both in the coppiced lime wood and near the conifers and over 1000 plants were counted in 1999 by Paul Kirby, Zella Harris Vi Wilkin and myself. This is undoubtedly the finest stand of the species in Lincolnshire. Very large coppiced specimens of *Tilia cordata* were present and a very good ground flora including wood sanicle, wood sorrel and wood anemone.

Small-leaved lime *Tilia cordata*.

During the early part of 1999, Tim Taylor discovered seedlings of *Tilia cordata* at Hatton Wood (conf. IW)

(Taylor, 1999). Subsequent visits (TT, IW) to Hatton, Goslings, Little Scrubbs, Great Scrubbs, Cocklode and Great West Woods showed that seedlings of the small leaved lime were present in all, but much more abundant in the older coppiced Hatton and Great West Woods. Seed germination and seedling growth in *Tilia cordata* is extremely rare in Lincolnshire and the 1999 prolific crops must be regarded as a very unusual occurrence depending on the multiplicity of climatic factors (Pigott, 1991). Normally in Lincolnshire reproduction is vegetative and few matured seedlings have been observed. Dr Keith Stephenson has grown on some of the 1999 seedlings.



Small leaved lime seedlings

photo I Weston

Roadside halophytes - Danish scurvy grass *Cochlearia danica* and thrift *Armeria maritima* *C. danica* has increased in density as well as length of verge populations on some of its sites along the main roads, although there have been no new square sightings this year. Two patches of *Armeria maritima* have been known now for three years on the verge of A158 near Wragby (P Wilson TF104779, I Weston TF154/773). They are associated with other salt lovers *Cochlearia danica* and *Atriplex prostrata*. Marshall (2000) has a note of another sighting of inland *Armeria maritima* from Buckinghamshire. These are the only reports of thrift on inland road verges that have been reported. The provenance is obscure but in both situations the roads have been salted. This inland thrift is not to be confused with Lincolnshire's great rarity – the Ancaster thrift (above) which is a distinct subspecies.

Arable weeds

Without doubt the most spectacular record for 1999 was made by Mr Geoff Nelson of cornflower *Centaurea cyanus* (plate 13) extending over many acres in a field of wheat adjacent to Thurlby Wood (SK88). Farmed by Mr J Iredale who is very much aware of the rarity of the species, it produced a rich blue sward over about six acres and in patches over more. Also recorded by Paul Kirby, Zella Harris, Vi Wilkin and myself in two places near Frieston, one large area in spoil from drainage works and another where it had been planted (as seed) from the drainage area. The local farmer said it was the second flowering year. It was also recorded from Grasby by Paul Kirby and from North Kyme in oilseed rape by Claire Weaver.

Corn marigold *Chrysanthemum segetum* was present in profusion in 1999 in fields near Market Rasen, Boston and Coningsby, near Grantham in cereals and at Boultham in a field of peas by Paul Kirby, Zella Harris, Vi Wilkin and myself and we also found a few hundred plants of thorn apple *Datura stramonium* in a field of cauliflowers near Boston - a most unusual sight. The cauliflowers were due for cutting and the thornapple was just fruiting. It will be interesting to see if any seed matures and germinates the following year.

Common broomrape *Orobanche minor* was found in its hundreds, if not thousands, parasitic on white clover in a field at Laughton by Zella Harris, Vi Wilkin and myself and also by Mr M Broadbridge on the roundabout road verge near the Humber Bridge on medicks and trefoil. Field woundwort *Stachys arvensis*, an uncommon arable weed, was recorded in the Whisby Nature Reserve by Phil Porter. Recent records include the colony at Thurlby Fen Nature Reserve which was encouraged to spread by Kaye Heath.

Alien plants

White wall rocket *Diplotaxis eruroides*, new to Lincolnshire, was found by myself and Paul Kirby & Zella Harris bordering two arable fields and along the roadside verge for some distance from two squares (TF34/TF44) near Leverington (VC53). This was confirmed by crucifer referee Dr Tim Rich who has kept specimens for the National Museum of Wales' herbarium. See also Clement & Foster (1994).

Mr K Harrison reported *Portulaca oleraceae* new to Lincolnshire in VC53. It was confirmed by Mr Eric Clement and is apparently often found in soil dumped from imported Egyptian potatoes (Clement & Foster, 1994). He also found Guernsey pigweed *Amaranthus blitum* in VC53, again new to Lincolnshire and confirmed by Mr E Clement. Zella Harris, Paul Kirby and Vi Wilkin, and I found Spanish stonecrop *Sedum hispanicum* (det. E Clement and confirmed at the Royal Horticultural Society Wisley) in quantity with other Sedums on the disused airfield at Holton-le-Clay near Waltham, Grimsby TA20. Both spotted and unspotted forms of monkey flower *Mimulus guttatus* was recorded in the Trust Reserve at Furze Hill TF36 in quantity by Zella Harris and myself. It is a species rarely introduced in Lincolnshire so this large splash of colour in the wetter part of the reserve was a surprise.

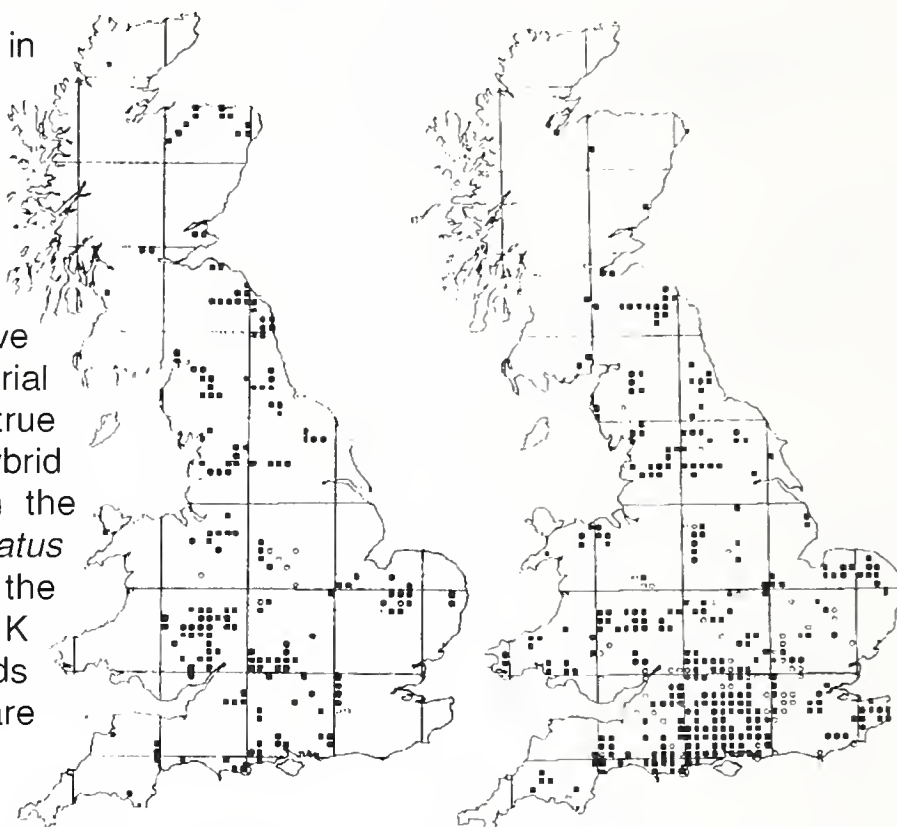
Aquatics

Good coverage of water plants has been made this year including the discovery of a very good site at Head Dyke-Car Dyke in TF14 where floating club-rush *Eleogiton fluitans*, lesser water plantain *Baldellia ranunculoides*, arrowhead *Sagittaria sagittifolia* and whorled water milfoil *Myriophyllum verticillatum* were recorded. seaside thistle *Carduus tenuiflorus* was also found on the bank at Willow Wath Pumping Station. In the North of the County Lindholme Lakes in SE70 had large colonies of golden dock *Rumex maritimus* and also fine-leaved water-dropwort *Oenanthe aquatica*. Soft hornwort *Ceratophyllum submersum* (2nd County Record) was found to be the dominant aquatic on a pond at Lowgate near Gosberton so much so that it has to be cleared regularly. It is the rarer of the two water hornworts and is being well looked after.

In some squares many-rooted duckweed *Spirodella polyrhiza* was plentiful, including several new square records and there has also been an increase in records of least duckweed *Lemna minuta* which is spreading in Great Britain from the South. Where the River Ancholme passes through Brigg, large amounts of common duckweed *Lemna minor* and fat duckweed *Lemna gibba* were growing as a mixed population. *Lemna gibba* has been recorded more frequently in 1999 than in many previous years. Large populations of arrowhead were also flourishing here. Water whorl grass *Catabrosa aquatica* seems to be in decline in Lincolnshire but the River Ancholme banksides in SE91 had flourishing colonies. This was a new record for the square.

The newly excavated drain at Boultham Mere had many aquatic and shoreline plants but there had been a sowing of Sharpe's seed mixture in it, so whilst nearly all the species are recorded at Boultham Mere Nature Reserve, the drain site plants had to be recorded as introduced. Other pumping stations had introduced aquatic and bankside species. Many seed mixtures also contain European strains. The new fishing pits at Messingham have a very fine aquatic and sand flora and a colony of white horehound *Marrubium vulgare* was found on one bank. This was most unexpected and not introduced as far as we know. Fringed water lily *Nymphaoides peltatus* seems to be prevalent in a lot of fishing pits. There was a new record from pits at Market Rasen and it was re-recorded from Tattershall, the Boston drain and the Stickney area.

Ranunculus fluitans was found in the River Witham at Barkston and nearby and from one site on the River Brant. Preston and Croft (1997) show no records for Lincolnshire but it was recorded in Gibbons (1975) from Grantham and Claypole as "native to fast flowing water". The material sent this year appears to be the true fertile species and not hybrid material and also differs from the stream water crowfoot *R. penicillatus* subspecies *fluitans* found from the East Glen TF01 at Greatford by K K Harrison in 1998. Only records determined by the referees are accepted for these taxa.



Mr Malcolm Pool has recorded a large colony of tussock *Ranunculus fluitans* & *R. penicillatus* (after Preston & Croft, 1997) sedge *Carex paniculata* near the River Witham in Grantham and it has also been re-recorded in SK95 (Mrs Thomasson, M Overton, I Weston). It was also newly recorded in TF27 near Scamblesby by Mrs Mitchell, Mrs C Harrison, and myself. Mr K Harrison has also recorded *Cardamine amara* on the East Glen from Greatford in TF01 while hemlock water dropwort *Oenanthe crocata* and angelica *Angelica archangelica* flowered profusely this year along the River Trent and at Whitton.. At a recording visit to the Denton Reservoir SK83, sheets of water chickweed *Myosoton aquaticum* covered the shore. This is a very local plant in the county, but can be seen at Whisby Pike Drain each year. The Denton population is the most extensive population seen to date in Lincolnshire.

The Whitton Bog was well recorded and produced a fine selection of sedges. The hybrid foxtail grass *Alopecurus x plettkii* was also found on the East side of the saltmarsh. Marsh foxtail *A. geniculatus*, one of the parent species, was recorded but the other, the rare bulbous foxtail *A. bulbosus*, could not be found.

Vi Wilkin reported *Pilularia globulifera* and also *Hydrocotyle vulgare* on sale at an aquatic nursery this year. The *Pilularia* was very well grown but looked larger than our native stock and the *Hydrocotyle* was not *H. vulgare* but a different species (at least one species of *Hydrocotyle*, *H. ranunculoides* from North America, is commonly sold in garden centres

and is becoming a dangerous invasive - Ed). Either may be a danger to native species if introduced into the wild and could cloud our knowledge of the distribution of native species. *Salvinia* water fern known as Brazilian bully has also been seen in Lincolnshire for sale.

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PLANT GALLS - Graeme Clayton

This is the first complete year that dedicated gall recording has been undertaken in Lincolnshire since the sterling efforts of Miss S.C. Stow in the early part of this century. (Stowe, 1907). British Plant Gall Society (BPGS) members have also provided me with their records from visits they have made to the County in the past. These will all help to establish a plant gall database for Lincolnshire. For 1999 I have amassed in the region of 350 records comprising around 75 species from approximately 17 sites.

An interesting gall was given to me by Rex Johnson during the LNU field trip to Callan's Lane Wood. This was the agamic generation of a gall wasp *Andricus quercus-radicis*, (Hymenoptera: Cynipidae). It induces a partly or entirely subterranean gall on either the base of the trunk or on the roots of indigenous oaks, and is known as a truffle gall. Due to this habit it is not often encountered. Even its sexual generation can escape detection until after the adults have emerged. A series of small holes then appear along twigs. If the agamic generation choose to lay their eggs in the leaf stalk or midrib then they produce slightly more conspicuous swellings.

A galled inflorescence from hogweed *Heracleum sphondylium*, sent to Dr Keith Harris of Surrey for identification, turned out to be one that he had not encountered before. Upon receipt of my specimens he began to find it easily locally. It was *Contarinia nicolayi*, produced by a gall midge (Diptera : Cecidomyiidae), and caused the flower buds to become swollen and spherical and to remain closed. I recorded it in Hartsholme Country Park, Swanholme Lakes SSSI and at Hackthorn. It is probably one of those species under-recorded through being overlooked, like many of the flower galls.

The Institute of Cell, Animal and Population Biology at the University of Edinburgh has been conducting research on gall wasps. On two occasions this year I was requested to

provide specimens of Lincolnshire galls to help with their work. The county is steadily gaining a reputation in having an active and enthusiastic gall representation.

I am expecting a proof copy of the new keys identifying plant galls within the next few weeks. It is due to be published in 2001 in the Field Studies Council's Aids to Identification in Difficult Groups of Animals and Plants (AIDGAP) series. Its publication is destined to create a benchmark in gall interest and recording. The involvement of BPGS members from conception to publication has ensured that it will be a comprehensive account of current knowledge. I have sent Mike Bloxham, the illustrator, a number of Lincolnshire galls so the county will be represented in what promises to become the new gall bible!

Acknowledgements. I have received sound advice, guidance and help in identification from:- Michael Chinery, Rex and Barbara Hancy, Keith Harris, Tom Higginbottom, Chris Leach, Margaret Redfern, John Robbins and David Savage.

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DRAGONFLIES AND DAMSELFLIES - John Redshaw

Red-eyed damselfly *Erythromma najas* continues to thrive and extend its range in the county, with new records from Tattershall Gravel Pits (TF2056) and the Bain Navigation at Horncastle (TF2568). At the latter site they were frequenting an area where there was much fringed water-lily. At Baston Fen, where 25 were recorded on yellow water-lily along a 300m section of the Counter Drain in 1998, over 200 were recorded from the same section in 1999. However the abundance of water-lily had been reduced considerably due to drain cleansing operations in November 1998 and it will be interesting to assess its effect on the 2000 population. The species was again recorded from Revesby Reservoir.

The banded demoiselle *Calopteryx splendens* was recorded from new sites at Kirkby on Bain pits (TF2362), the River Bain at Ranby (TF2377) and Donington on Bain (TF2383), and from a garden pond at Halton Hologate (TF4165). A better spread of large red damselfly *Pyrrosoma nymphula* sightings was received with records from Kirkby on Bain, Ostler's Plantation (TF2262), Roughton (TF2464) and Halton Hologate.

The only hairy dragonfly *Brachytron pratense* records were from the usual Baston/Thurlby Fen sites and from Pinchbeck South Fen Slippe (TF12). The variable damselfly *Coenagrion pulchellum* also produced good numbers in the Baston/Thurlby Fen area.

SHIELDBUGS - Annette Binding

One of the most exciting finds of the year was the discovery of *Podops inuncta*, the European turtlebug, at Stanton's Pit Reserve on the 6th July. A small dark brown bug, it is easily identified by the two small curved projections at the front of the pronotum. It was last recorded in 1986 by Dr Peter Kirby at Ancaster Valley. It had, however, been found at Little Bytham in July 1900, which is very close to Stanton's Pit.

In 1998 the green shieldbug *Palomena prasina* was rediscovered in the county after an absence of seventy years. In 1999 we again found it at the same site in Scotgrove Wood. We also found specimens at two other woods in the same area, at Southrey Wood on the 4th July and Wickenby Wood on the 27th August. In the south of the county the species was found by Allan Binding at Grimsthorpe Park on the 2nd August. John Lamin also

found one adult at Grimsthorpe Park on the 22nd October and he also found specimens at Bourne South Fen between the 18th and 26th October. Dr Peter Kirby told us that the species appears to be extending its range and that certainly seems to be the case in Lincolnshire. We now have five known sites. All the specimens found in 1999 were in the typical habitat of nettles and brambles.

Rhacognathus punctatus, a species with only two known sites in Lincolnshire prior to 1999, was found at a new site when a single specimen was swept from rushes at Crowle Moor North by Allan Binding on the 29th July. I found a single *Picromerus bidens* on a fence post at the same site, another species with very few records. *Troilus luridus*, which was not found in 1998, turned up at two sites in 1999. John Lamin sent me a specimen caught at Bourne Wood on the 11th September and we found one at the LNU Langholme Wood meeting on the 17th October. Once again there was only one record of the blue bug *Zicrona caerulea*, this time at Whisby Nature Park, Lincoln where it had previously been recorded in 1993 and 1994.

Most of the commoner species had the usual amount of records but the hawthorn shieldbug *Acanthosoma haemorrhoidale*, was markedly more widespread in 1999, being found on hawthorns across the county. Most of the records were late summer to early autumn, although adults can be found in the Spring emerging from Winter hibernation.

BEETLES - Roger Key

By far the most exciting record of the year was the rove beetle *Velleius dilataus* RDB1, found by John Lamin at Grimsthorpe Park on 30 July and identified by Annette Binding. This an extremely rare beetle that inhabits the nests of hornets *Vespa crabro* when they nest in cavities of large old trees. It has never before been found before north of Oxfordshire and is rarely found outside the New Forest. There has been no other indication of *Velleius* expanding its range with the recent re-increase in range of the hornet. Its presence at Grimsthorpe indicates that the population of hornets there almost certainly survived the period in the middle decades of the 20th century when the hornet declined dramatically and retreated to the very south of England.

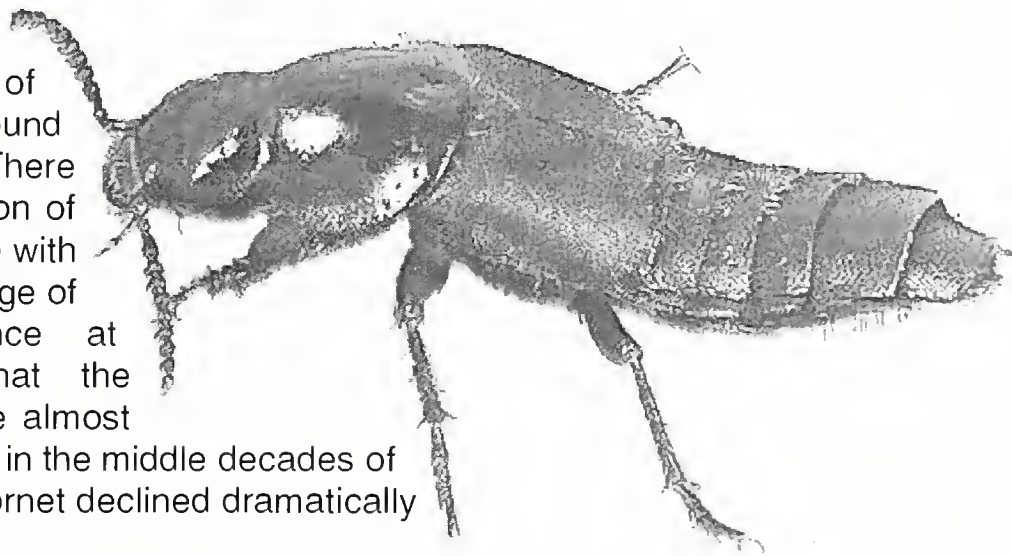


photo RS Key

John managed to find another species new to the county from Grimsthorpe Park on 3rd September: the scarlet and black net-winged beetle *Platycis minuta* (Nat Scarce B), again identified by Annette. Our usual net winged beetle in Lincolnshire is *Pyropterus nigroruber* (RDB3), a much rarer species nationally, but quite a speciality of the north east midlands. He also made two rather surprising records (both second county records) pine feeding beetles on quite isolated pines in the fens. One was the longhorn *Asemum striatum* from Bourne South Fen in May, last seen at Linwood in 1914, the other the weevil *Pissodes castaneus* at Baston Fen on 15th March, otherwise known from a single record in Laughton Forest. Both were identified by Annette Binding.

Annette and Allan Binding found *Hylecoetus dermestoides* (Nat Scarce B) at Crowle Moors

on 7th May, new to Lincs, although the species is well known elsewhere on the Thorne/Goole Moors complex. Both of these new species live in dead wood. They also found the weevil *Dorytomus hirtipennis* (Nat Scarce A) at Heath's Meadow, Bratoft on 26th June, new to Lincs. This species feeds on willow catkins and has very characteristic hairy antennae.

Among many other noteworthy species found by Allan and Annette Binding a number of special note: *Ctenicera cuprea*, a common upland purple click beetle, but uncommon in the lowland east of Britain, from Linwood Warren on 29th May, the 10th Lincs record and only the 2nd since 1911. The wharf borer *Nacerdes melanura* from Washingborough on 31st July, the first record since 1956 - usually a coastal dead wood species on salt-water soaked wood though there are two old records from Lincoln. The leaf beetle *Cryptocephalus moraei* on St John's Wort from Stanton's Pit on 6th July (the other 4 county records are from Morkery Wood - just up the road), the weevil *Magdalis cerasi* (Nat Scarce B) from Linwood Warren on 29th May the 3rd Lincs record, carrion beetle *Paralister purpurascens* from South Hykeham on 8th April, the 2nd county record, the seed weevil *Protopion ononicola* on rest harrow at Heath's Meadow, Bratoft on 26th June (2nd Lincs record) and weevil *Amalorrhynchus melanarius* on watercress at Keal Carr on 16th June, the 3rd Lincs record.

Other very significant records in the year were two specimens of the very large water beetle *Dytiscus dimidiatus* (RDB3) found by Alan Lazenby. The first one was found dead and in pieces on a track at Poplar Farm, Tanvats and needed confirmation by leading water beetle expert Garth Foster from Balfour-Browne Club. The second specimen was found by Alan's grandson in the garden pond at Blankney Fen on 30th October. This species has never been found in Lincolnshire before and is very rare nationally, usually confined to rich fenlands, with its distribution centred on the Cambridgeshire Fens and Norfolk Broads, with isolated populations in Cornwall and County Durham (Foster, in press).



Water beetle *Dytiscus dimidiatus* (map kindly supplied by Balfour-Browne Club)

Two other significant records by Alan were of the "carrion" beetle *Aclypea opaca* (which actually eats plant material!) (Nationally Scarce A) from Blankney Barff on 31st August and the rove beetle *Philonthus rectangulus* from Blankney Fen on 16th August. The former has declined markedly in recent years and I described it as extinct in Lincolnshire in my presidential address in 1995 (Key, 1996), having last been seen in the county in 1951, while the latter is a fairly recent addition to Britain's fauna from South East Asia (Hodge & Jones, 1995) and is only the second record in the county.

Two species new to the county turned up on the LNU meeting at High Dyke on 20th June. Graeme Clayton found the Nationally Scarce (B) chafer *Omalopia ruricola* (plate 14). This is a typical calcareous grassland species, largely restricted to southern England, and this may well be its northernmost record. The other new county record was of the small weevil *Ceutorhynchus picitarsis* which I found on its foodplant, hedge mustard.

An unusual new record was of the tiny little *Telmatophilus schoenherri* (RDBK) which John Bratton found on its foodplant, lesser reedmace at Far Ings on 13th June (Bratton, 2000). There were three other records of this species in the county and John has checked the original specimens and found them all to be the common *Telmatophilus typhae*, so the species is new after all. John also found the second Lincs specimen of the tiny aquatic weevil *Stenopelmus rufinasus*, in the Old South Eau on 1st October, the first being from the Cross Dyke SSSI in 1995. This is a naturalised species, purported to feed on the alien floating fern *Azolla filiculoides*, although neither Lincs specimen seemed to be associated with the fern.

The only other new county record of 1999 was of the small silvanid beetle *Ahasverus advena* found indoors at Glenthams by Colin Smith on 3rd September. This is a stored products pest species, usually found in grain stores. With it was another stored product feeding species *Cryptolestes ferrugineus*, which has only been found before in the county in 1913. This species sometimes also turns up out of doors under tree bark.

Colin sent over 600 specimens for identification in 1999, which included seven Nationally Scarce and 14 species that are rare in the county. Nationally Scarce (B) species included only the second county records of the tiny plaster beetle *Enicmus rugosus* and the "false darkling beetle" *Hallomenus binotatus* from Linwood Warren on 11th April and 23rd August respectively, the weevil *Phyllobius vespertinus*, which feeds on sea wormwood from Huttoft on 16th May, the spider beetle *Ptinus seipunctatus* from Market Rasen on 2nd May, the jewel beetle *Agilus laticornis* most unusually at light from Willingham Forest on 29th June and the small yellowish soldier beetle *Rhagonycha lutea* from Wickenby Wood on 9th July. He also found the 2nd county record of the water beetle *Coelambus nigrolineatus* at light at Market Rasen on 2nd September, a species known to be spreading in Britain and only added to the county list in 1998. Another significant species that Colin found was the large weevil *Otiorhynchus clavipes* which obviously has a strong population in his garden, having turned up 5 times during the year between March and October. It was last found in the county in 1954 and there have been only four earlier records.

A number of the LNU Meetings in 1999 produced significant records: at Callan's Lane Wood on 25th April larvae of *Prionocyphon serricornis* (Nat Scarce B) turned up in a water filled tree rot-hole, the typical habitat for this species. It has only otherwise been found by Andy Godfrey at Hagnaby. Annette Binding also found the primitive weevil *Anthribus nebulosus* (Nat Scarce B), the 3rd Lincs record. In the acid grassland at Normanby Park on 15th August, the small bronze flea beetle *Psylliodes cuprea*, that feeds on various members of the cabbage family, turned up, the first record in the county since 1908. I also found the small red weevil on sheep's sorrel *Apion rubens*, the 3rd county record and the first since 1910. Rex Johnson found remains of the red longhorn beetle *Leptura rubra*, a species that had not been seen since 1948 when it turned up at Laughton in 1998 (Key, 1999). It has been turning up in various other parts of England and is obviously currently expanding its range. At Bagmoor Gullet on the same afternoon I found *Gymnetron villosulum* (Nat Scarce B), a small weevil that feeds on water speedwells *Veronica* spp with only 6 other county records, and the second county record of the rove beetle *Platystethus degener*, otherwise only known from Conesby Mine, only a mile or two away.

Closely related to *Apion rubens* but much rarer is *Apion rubiginosum* (RDB3), also on sheep's sorrel, which turned up at the fungus foray Langholme Wood on 17th October. This is only the second record for the county, it having been found at Moor Farm in 1996. Also at Langholme Wood was the darkling beetle *Corticeus unicolor* RDB3 which feeds in bracket fungi, usually on birch. Somewhat of a speciality of the North East Midlands, this is only the third record of this rare species in the county.

Other interesting species in the year include the churchyard beetle *Blaps mucronata* which Annette Faulkner found in Gosberton churchyard on 12th August. There are only two other recent records of this large synanthropic beetle, from Crowland and Washingborough. I found the tiny flea beetle *Longitarsus nigrofasciatus* (Nat Scarce A) (determined by Dr Mike Cox at the Natural History Museum) at Kirkby Moor on 21st April. The only other record is from "Langworth Wood" by Canon W Fowler in the 19th century, but these little beetles are so difficult to identify that the record cannot be accepted without a voucher specimen. I also found the little ground beetle *Bembidion clarki* (Nat Scarce B) among reed litter at Surfleet Lows on 2nd October, only the second record of the species in the county since the 1940s. On the same day I found the hairy flea beetle *Epitrix pubescens* on bittersweet, the first county record being at Laughton the previous year.

John Bratton found the water beetle *Rhantus suturalis* (Nat Scarce B) a pool near the River Glen east of Guthram Gowt and in the "wildlife pond" at Crowland Lido, both on 2nd October. These are the first records of this scarce species since 1959. Finally, Mike Denton found the little mud beetle *Heterocerus obsoletus*, which burrows into intertidal sand, at Rimac on 3rd August. The only two other records from Lincolnshire are from the 19th century.

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BUTTERFLIES - Allan Binding

Many species of butterflies have had a very good year. Meadow brown, ringlets and gatekeepers were very common. In many of the Lincolnshire Wildlife Trust reserve meadows I visited in June, hundreds of meadow browns could be seen flying amongst the grasses and wall browns were quite commonly seen in small groups on many of the reserves I visited.

Small tortoiseshell and peacock have become very common again this year after quite a few years of their numbers being depressed, possibly due to the wet summers we have had. I found large numbers of their larvae at Cliff Lane, Heighington this year on the nettle beds and in autumn the small tortoiseshell became one of the most commonly seen butterflies at many places I visited.

Brown Argus were seen again at quite a few locations in the county again this year. Holly blue were quite common in the spring, but very few of the summer brood were seen. Small coppers were on the wing from May till October. The last two that I saw were at Tesco's Garage in Lincoln on the 10 October, flying around the forecourt and settling on a petrol pump and at Castle Hill field at Welbourne on the 13 October.

All three white species of butterfly were plentiful this year as were brimstones and commas, both of which were also seen at Castle Hill field, Welbourne on the 13 October.

A few migrant species were recorded, the most common in 1999 being the red admiral. Very few painted lady or clouded yellow were seen although Phil Porter reported seeing the latter at Whisby Nature Park.

There was an unconfirmed report of a swallowtail at Skegness, and Kevin Wilson, Trust Warden at Gibraltar Point, found an exotic swallowtail-like species while carrying out a transect walk on the 10 July. It must have almost certainly escaped from Natureland's Butterfly House. Mr S Wilson of Kingscliff, Northamptonshire contacted English Nature and myself informing us that his wife had bought some organic vegetables locally (Produce of the Netherlands) including carrots. When she went to put the carrot tops in her dustbin she noticed a butterfly chrysalis on them. When the butterfly emerged from the chrysalis later, they were amazed to find out it was a Swallowtail. Not knowing what to do, they decided to release it at Glington, Cambridgeshire near Market Deeping in July.

MOTHS - Phil Porter

1999 was another rather mediocre year, at least for macro-moth recording. Nights with ideal trapping conditions were relatively few and the total for macro-moth species in the county was 432, representing a similar number to the previous year and a reasonable total.

Macro-moths

It was another good year for clearwings with currant, large red-belted, red-tipped, hornet moth and lunar hornet moth all recorded. Other notable records include the fern, lesser spotted pinion, scarce tissue, black rustic, gold spangle, light feathered rustic, satin beauty, striped twin-spot carpet, yellow belle and especially waved black, discovered by John Lamin during National Moth Night on 17th July in Twyford Forest. There is only one previous Lincolnshire record for this species from Boston in 1980. On the other hand a number of regularly recorded species went unseen during the year. Alder moth, tawny shears, little emerald, garden dart, clouded buff and broad-bordered bee hawk moth were examples.

Micro-moths

Last year Rex Johnson anticipated the arrival of the new colonist, the firethorn leaf-miner *Phyllonorycter leucographella* and records from the following localities ensued; Hubbert's Bridge and Bulby on 18th February, Scotton on 1st March and Pinchbeck on 7th March. In the latter two cases the attentions of the moths devastated the shrubs' foliage. The larvae mine the upper surface of *Pyracantha* leaves causing clearly noticeable blisters. The favoured food-plant is *Pyracantha coccinea*, which is evergreen, and the larvae can continue to feed throughout the winter. If you know of a source of the food-plant in your area please look for "blistered" leaves so we can monitor the progress of this species in Lincolnshire.

A pyralid moth new to the county turned up at Twyford Wood on National Moth Night on 17th July. This was *Anania funebris* (plate 15) which came to Rex's light. Thanks to recording by John Lamin and Colin Smith, a total of 13 micro-moth county records were noted in 1999 plus 18 vice-county records and several more seen for the first time since they were recorded by Mason in the early years of the century.

The new county records were;

<i>Bohemannia quadrimaculella</i>	Bourne South Fen 10 th June	<i>Stenolechia gemmella</i>	Grimsthorpe Pk 27 th August
<i>Etainia decentella</i>	Market Rasen 2 nd Sept	<i>Cochylimorpha alternana</i>	Caenby 26 th August
<i>Infurcitinia argentimaculella</i>	Grimsthorpe Park 2 nd July	<i>Epinotia subsequana</i>	Bourne South Fen 26 th April
<i>Choreutis myllerana</i>	Baston Fen 31 ^s May 3 rd Aug	<i>Dichrorampha flavidorsana</i>	Rippingale no date
<i>Argyresthia dilectella</i>	Bourne South Fen 22 nd Oct	<i>Dichrorampha aeratana</i>	Rippingale no date
<i>Coleophora prunifoliae</i>	Grimsthorpe Park 17 th Oct	<i>Anania funebris</i>	Twyford Forest 17 th July
<i>Ptocheuusa paupella</i>	Callans Lane Wood 1 st Aug		

Migrant Species.

The year was not a great one for migrants although there were seven records of convolvulus hawk moth and five of humming-bird hawk moth. Climatic changes might be responsible for the possible change in status of the bedstraw hawk moth which may be temporarily established in the Laughton Forest area, where it has been recorded as larvae in several recent years. There was a larva at Normanby Park in August on heath bedstraw. The vestal was at Grimsthorpe Park on 27th August, the delicate at Muckton on 23rd September and the Kent black arches at Gibraltar Point on 30th June. The latter species may also need to be re-assessed in the light of regular records there since 1994. Breeding has also been confirmed on dewberry in the dunes. The commoner migrants such as silver Y, pearly underwing and dark sword-grass were recorded in average numbers.

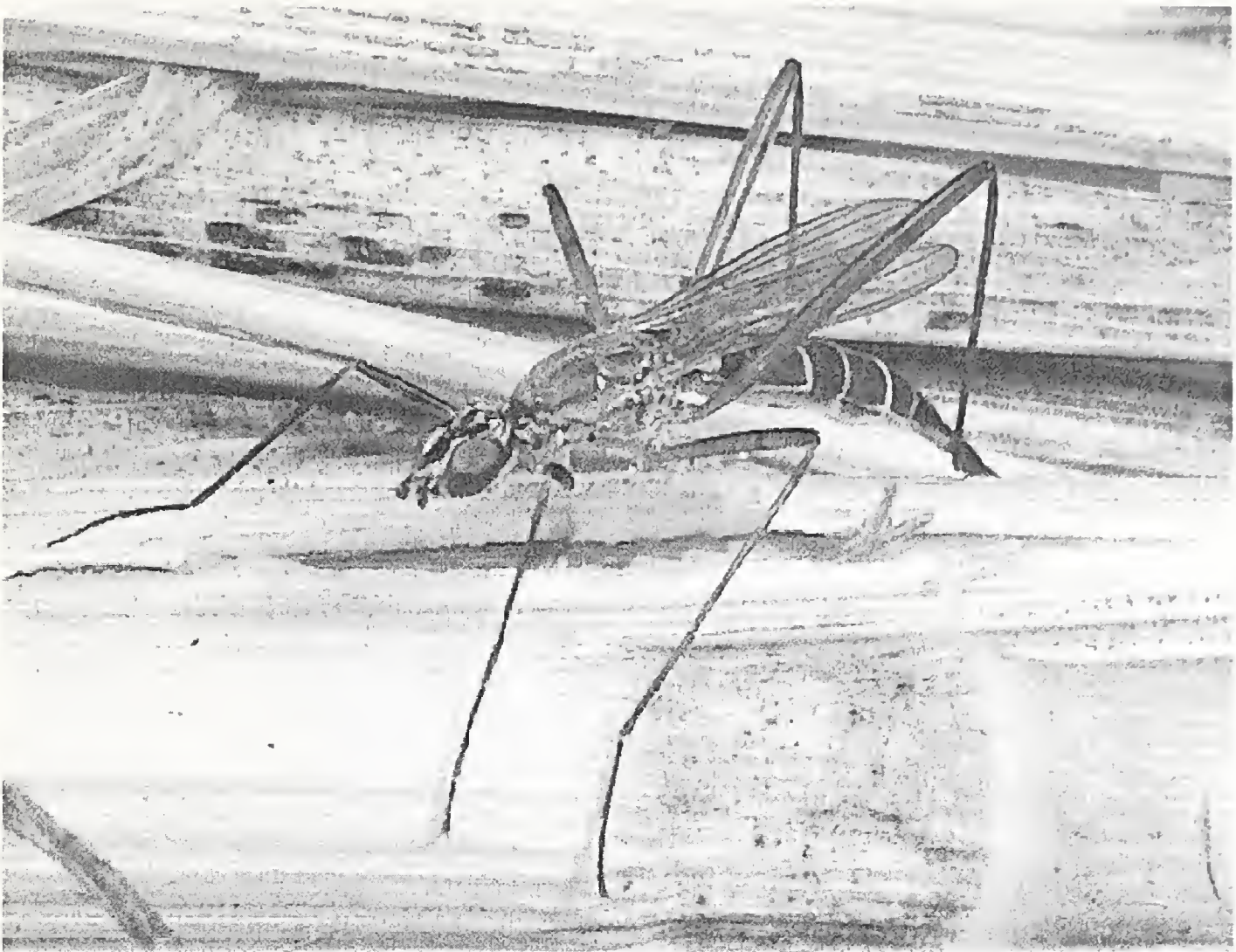
Although no migrant, there was a fascinating record from John Lamin of a remarkable import at Bourne market in April where a bunch of bananas yielded a specimen of the South American moth *Anticloris eriphia*, the banana stowaway. This curiously shaped blackish moth represents perhaps only the second British record.

FLIES - Andy Godfrey & Jill Mears

Material collected in 1995 by J. Francis was passed to me last year for identification. This included the Nationally Scarce *Thaumatomyia rufa* (Chloropidae) from Haxey. This species is found in a variety of habitats including damp heathland and willow carr. Several local species were also encountered, including the small dance fly *Drapetis nigritella* (Empididae), recorded from Caenby Corner, and the woodlouse parasite fly *Paykullia maculata* (Rhinophoridae) which has distinctively marked wings and was recorded from Little Scrubbs Wood and Great West Wood. Also local are *Loewia foetida* (Tachinidae), a parasite of centipedes recorded from Little Scrubbs Wood, whilst the scarce greenbottle *Lucilia ampullacea* (Calliphoridae) was also recorded from Great West Wood.

A batch of flies from Annette Binding included several interesting species particularly since several were reared and the puparia were present with the adults. The life histories and early stages of many flies are still unknown so this sort of material is most valuable. The puparia are useful as they often include the larval mouthparts on the pupal cap, which are used for identifying larvae as well as for ageing pupae and working out evolutionary trends. The reared material included *Phalacrotophora fasciata* (Phoridae) reared from ladybird pupa taken from Kirkby Moor, the common parasite fly *Carcelia lucorum* (Tachinidae) reared from garden tiger taken at Messingham, *Phaonia palpata* (Muscidae) reared from a pupa found in soil under a dead tree trunk in Chambers Wood and *Hydrophoria lancifer* (Anthomyiidae) from a pupa also taken in Chambers Wood. Amongst the scarce species in the batch was the small saproxylic fly *Clusiodes gentilis* (Clusiidae) which is mainly found in southern England but was taken by Annette in the Washingborough Hall Hotel! A nearby mature tree or wood will be the provenance of the fly.

On the LNU meeting at Normanby Park on 15th August Roger Key found an unusually long legged fly which turned out to be the Nationally Scarce stilt fly *Micropeza lateralis* (Micropezidae), a species commonly found on heathland, though usually not far from water. The pretty green soldierfly *Oplodontha viridula* was found in the same afternoon at Bagmoor and also at Bourne South Fen. It is another wetland species and is quite scarce in Lincolnshire. A large black and yellow soldierfly, *Stratiomys singularior*, very spectacular to see in the field also turned up at the same two sites. It is usually found on brackish marshes and is very uncommon in Britain.



Micropeza lateralis

photo RS Key

1999 was an extremely good year for hoverflies. Over the year a large number of specimens were received and this report only includes those which are of exceptional interest, mostly being the second or third Lincolnshire records.

At the LNU meeting to Callan's Lane Wood in late April Mr & Mrs A Binding found the second Lincolnshire record of *Cheilosia fraterna*, otherwise recorded from Sotby Wood in 1997, and also the spring species *Pipiza luteitarsis* previously known only from Grebby Hall. The tiny species *Neoscia meticulosa* was found at Whisby Nature Reserve, also in April. It is a wetland species associated with *Glyceria* and *Typha* and tends to be very local, this is only the third site known in Lincolnshire.

The dead wood bee mimic hoverflies *Criorhina berberina*, the most common member of the genus, and *Criorhina floccosa* (illustrated overleaf) were recorded from Chambers Plantation and Moor Farm respectively. These are good spring hoverflies as they are often quite reclusive, basking on leaves or blossoms usually high in the canopy.

In May, a visit to Nettleton Hill by Phil Porter produced *Cheilosia intonsa*. This species seems to have a very scattered distribution throughout most of Britain, excluding the east above the Thames Valley however recent Lincolnshire records are filling this gap rapidly. Also in May, *Cheilosia pubera* was recorded at College Wood by Mr & Mrs Binding. Before 1996, this species had not been recorded in Lincolnshire for over one hundred years but it now seems to be quite a frequent spring species. Was it perhaps overlooked in the past? Probably not as this is a rather distinctive species having a bronze sheen which is easily seen in the field, instead of the solid black of most other *Cheilosia* species.



Criorhina floccosa

photo RS Key

The wetland species *Platycheirus fulviventris* turned up at Crowle Moors (Mr & Mrs Binding) and Messingham Sand Quarry (Austin Brackenbury). This is a species of good quality wetland habitat with the larvae feeding exclusively on the aphid *Hyalopterus pruni*. It is a rather infrequent species in Lincolnshire with isolated records being received over the last few years. *Chrysotoxum festivum*, a species associated with scrub edges and grassland, was also found at Messingham Sand Quarry by Mr Brackenbury, it is a very local species in Lincolnshire.

Another excellent record, *Xanthandrus comtus*, came from Callan's Lane Wood by John Lamin. This is the second Lincolnshire record but, of more interest, it was caught at mercury vapour light. The species was considered to be very rare (RDB2) but has since been reclassified to Nationally Scarce as in recent years records have increased. The larvae are predatory on tortricid micro-moths and the adults are usually associated with good quality woodlands.

John Lamin found another good wetland species, this time *Anasimyia contracta* at Baston Fen. This was only previously known from Tattershall Gravel Pits. Its distribution tends to avoid chalk and limestone so this is a particularly good record for this county. By contrast, in October Bourne South Fen produced a woodland species, *Didea fasciata*, the larvae of which usually feed on aphids associated with conifers but also may feed on aphids on *Salix* species, the latter probably more likely in this case. This species is active from very

early spring to late autumn.

Finally, a late identification for 1998 produced a new county record, *Platycheirus occulatus*, from Whisby Nature Park. In the last year a second record was received from Great West Wood. Very little is known about this species as it was only separated from *Platycheirus clypeatus* in 1990 and there are therefore very few records as yet. From information collected so far, it seems to be associated with good quality wetlands, whether fen, bog, moor or marsh and be more frequent than perhaps first thought.

WASPS, ANTS and BEES - Michael Archer

One new species has been added during 1999 to the list of aculeate Hymenoptera from Lincolnshire, which now totals 278 species. The new species is *Dipogon variegatus* (Linn.) taken by Annette Faulkner at Spalding. This spider hunting wasp is widely distributed throughout England, Wales, Scotland and Ireland. It nests in any cavity but particularly in timber and walls.

Other important species are *Philanthus triangulum* (Fab.), the fourth record, and *Ectemnius sexcinctus* (Fab.), the sixth record, both from Messingham Sand Quarry by M.E. Archer.

I have finished going through the collections at Liverpool and Nottingham Museums looking for records from Lincolnshire. In Liverpool Museum I found specimens taken by H. Britten at Grantham and at Nottingham Museum specimens mainly taken by H.P. Jones at Hammeringham. It was interesting to see the bumblebees, *Bombus ruderarius* (Muller), *B. sylvarum* (Linn.) and *B. humilis* Illiger, which are now extinct in Lincolnshire.

MOLLUSCS - John Redshaw

Following hot on the heels of the re-discovery of the shelled slug *Testacella haliotidea* in Gainsborough in 1998, after an unrecorded gap of 100 years, the county's other shelled slug *Testacella scutulum* (plate 16) was found in 1999. Six specimens of the latter species were found by John Turner whilst digging his garden in Alford, (TF 454755) on 14th October. All six specimens were passed to me on 20th October by Colin Hutchinson. *Testacella scutulum* is a carnivorous species that lives on earthworms. The specimens were fed on worms at intervals throughout the winter months and five were still surviving by 10th March 2000 and appeared to be healthy.

Testacella scutulum was first recorded in Lincs at Nettleton House (TA 110008) by Miss Allett on 28th January 1903. An earlier record from Stamford in December 1897 proved to have been found in High Park Gardens, south of the county boundary. The only other county record is from Grantham where a specimen was found by Miss Stow on 30th March 1920. The discovery of these two subterranean species after such long periods of time indicates the dangers in assuming that some of our less obvious species may be extinct.

Mr Chris du Feu and the Queen Elizabeth High School's Slug Safari Group at Gainsborough continue to record slug species from their local area and from further afield, thereby adding to our overall knowledge of slug distribution. Thirteen new 10km records were received for 1999, including the slugs *Arion fasciatus*, *A. silvaticus* and *A. circumscriptus* segregates of the *A. circumscriptus* group, and *A. distinctus* of the *A. hortensis* group. A recent colonist in the Gainsborough area has been the worm slug *Boettgerilla pallens*. Discovered by the S.S.G. in SK88 in 1994, the species was found in SK89 in the school grounds in 1999.

Early in the year I undertook surveys of aquatic molluscs for the Environment Agency at several sites throughout the county and the details have been entered into the Union's

records, courtesy of the Agency. The pea mussel *Pisidium obtusale* was widespread at Saltfleetby Theddlethorpe NNR, only the 2nd record for the 10km square. Although relatively common in the south of the county, it is far more scarce in the north.

I am grateful to Dr MP Kerney for determination of critical species, and Mr. Du Feu acknowledges the help of Ms S Davies in determination or confirmation of the more difficult slug species.

SPIDERS - Annette Binding



Arctosa perita

photo RS Key

In 1999 we added almost 300 records to the Lincolnshire Lists. Several interesting species of wolf spider were recorded during the year. *Arctosa perita* was again present in good numbers at Kirkby Moor. We also found it at Stanton's Pit and at Whisby Pits. John Lamin sent me a further specimen caught at Bourne South Fen in October. *Alopecosa pulverulenta* was found at Crowle Moor South reserve on the 7th May and the related *Alopecosa barbipes* was recorded at Langholme Wood on the LNU meeting on 17th October. Both specimens were males and are fairly large spiders which prefer open dry habitats. Males and females of another large wolf spider, *Trochosa ruricola*, were found at Crowle Moor South on 7th May under stones etc on the peat. This species prefers damp places and has been recorded at a number of sites throughout the county, although not previously at Crowle Moor, and was found in the wetter parts of the reserve.

Among the jumping spiders (*Salticidae*), *Heliophanus flavipes* was found at Whisby Pits on 27th April and at Rauceby Warren on 17th July. There were very few other records and only three of *Salticus scenicus*, the zebra spider, which is normally very common on houses and walls.

The *Araneidae* were well represented in 1999. Phil Porter found an enormous gravid female *Larinioides patagiatus* in reedmace at Whisby Nature Reserve on 27th April. The large flattened *Nuctenea umbratica* was recorded at Willow Court, Washingborough. A very dark-coloured species, some of those we have found in Washingborough appear to be almost completely black. They are usually found at night, often on walls and fence posts, and spin an orb-web similar to that of the garden-cross Spider *Araneus diadematus* in which they catch moths and other nocturnal insects. *Larinioides cornutus*, a species which likes damper areas and which is often found near water, was found at several new sites during the year. I found the tear-drop shaped *Cyclosa conica* at Moor Farm on 5th May and John Lamin sent me a specimen from Temple Wood on 3rd May. I recorded a single specimen of *Gibbaranea gibbosa* at Kirkby Moor on 17th May. Although it is listed as common, I only seem to be able to find one specimen each year.

This year I also looked at *Tegenaria* spiders. This genus includes the large hairy spiders which are commonly found in houses, running across the carpet or trapped in the bath. Most of the species are found in houses, garages and outbuildings and make the familiar sheet webs which can get quite large in undisturbed corners. The species I found most often was *Tegenaria domestica* which although large and hairy was not as large or hairy as the *Tegenaria duellica* spiders found in a local hotel. The female of this species has a body length of up to 18mm and correspondingly longer legs so appearing very much bigger and blacker than *Tegenaria domestica*. The females live for several years and can go for some time without food and water. My most interesting *Tegenaria* spider was a female *Tegenaria agrestis* which I found under stones at Pasture Wharf on 21st August. This species is not usually found in houses, but prefers open waste ground. It is also a large spider, the female can be up to 15mm long and when it is found indoors it can be very aggressive, biting readily. This was only the second record for Lincolnshire, the only other being for Cleethorpes in September 1976 found by George Whatmough and identified by Mr P J Wilson. It is probably more widespread in the county than these records suggest and is one I will be keeping a lookout for in suitable habitats in the future.

WOODLICE - Neil Pike

One of the most interesting results of the recording effort for woodlice this year has been the increase in records for the blind ant woodlouse *Platyarthrus hofmannseggii*.

This tiny white woodlouse has one of the most interesting lifestyles of any British Isopod. With a length that rarely exceeds 5mm, it is one of our smallest species and appears white to the naked eye, but under a microscope or strong hand-lens is a beautiful cream colour and semi-translucent. Unlike most British woodlice *Platyarthrus* is completely blind.

For a woodlouse, being small and blind would seem to be a distinct disadvantage but *Platyarthrus* has developed a lifestyle that helps protect it from predators. It lives in ant's nests, especially those of the yellow meadow ant *Lasius flavus*, but also the black garden ant *Lasius niger* and other species. It is tolerated by the ants, the reasons for this are not entirely clear, the species may perform a service in ant's nests (for example, it may feed on fungus that would normally attack ant grubs) or it may be a grub mimic, the ants protecting the woodlouse because they react to it as one of their own larvae. When I have seen the species in disturbed ants nests, the ants appear not to carry the woodlouse to safety as they do their grubs, but one needs a rapid eye to tell grubs from woodlice in the ensuing melee! Field observation of *Platyarthrus* is difficult because it only ever tends to be seen disappearing deeper into ants nests after it has been disturbed.

Because the species is so small and only occurs in ants nests, *Platyarthrus* is under-



Platyarthrus hofmannseggi

photo RS Key

recorded in the county, being considered common in the country as a whole. Previous records have come from Messingham, Twyford (where the species was recorded during the 1997 field visit) and one or two other sites. In 1999, the species was recorded from Bagmoor, West Keal, Boston, south Lincoln and Colin Smith recorded it from Market Rasen, suggesting a wide distribution. If members do disturb ants nests whilst gardening, look carefully! Any records of this fascinating species would be gratefully received.

MAMMALS, REPTILES & AMPHIBIANS - Norah Goom

Reviewing the records for 1999 became an occasion for a backward look at the changes in the situation over the previous six years and highlighted the need to remember the influence exerted over them by changes in the recorders submitting them. The records received are generally random, important as evidence of presence of a species in a particular area but not giving a picture of its distribution or status throughout the county. Few LNU members are consistently working a site or species and records of some species may have acquired undue weight owing to the enthusiasm of one observer for that species. Many mammals are not frequently seen because they are nocturnal and show up mainly as "dead on road". Road-kills are therefore included in the records as evidence of presence in an area, as are well authenticated tracks trails and droppings.

The records for small mammals in 1999 provide an interesting comparison between numbers of records sent in the normal way by members and numbers of individuals consumed by barn owls *Tyto alba*. K.D. Robertson carried out a painstaking analysis of barn owl pellets collected in January. 9 large pellets from a ditch bank at Roughton contained skeletal remains of two water voles *Arvicola terrestris* and no other mammals. LNU members added two more records. Fortunately, one cannot blame the current low

status of the water vole entirely on predation by barn owls. Mr. Robertson went on to examine over 60 pellets from Fulstow, producing 13 records of pygmy shrew *Sorex minutus*, the only ones for the year. Barn owl pellets yielded twice as many records of common shrews *Sorex araneus* and bank voles *Clethrionomys glareolus* as did the LNU. While the difference between the two sets of records for field vole *Microtus agrestis* from this set of pellets is large, that for wood mouse *Apodemus sylvaticus* is a surprising; 12 from the LNU against 40 from the pellets. The hit rate for barn owls is clearly rather higher than for humans.

An increase in the numbers of brown rat *Rattus norvegicus* made the news several times during the last 3 years. Our records show a slight drop in 1999 but this not sufficient to conclude that they have passed a peak or been brought under control. Grey squirrel *Sciurus carolinensis* and fox *Vulpes vulpes* were both seen frequently during the year, though the numbers reported were very slightly lower than in 1998. Stoat *Mustela erminea* and weasel *M. nivalis* appeared to be at their average level, with many casualties on the roads, Badger *Meles meles*, still on the "confidential" list, also suffered in this way, with half the reports being of corpses on the road. The habitat of the other "confidential" species, the otter *Lutra lutra* is now the subject of survey by Lapwings Consultancy. Reports of deer have not been numerous but this may be due in part to observers' lack of confidence in assigning them to the particular species on the basis of fleeting glimpses.

Our only cetacean record was of a female bottle-nosed dolphin *Tursiops truncatus* in the Trent between 25th-30th January at Gainsborough, recorded by Phil Palmer of the Nottinghamshire Naturalists.

Reptiles are notorious for being no more than a rustle in the vegetation so the paucity of records is hardly surprising. Only 2 adders *Vipera berus* were reported and 14 grass snakes *Natrix natrix* which over the years has given rise to twice as many records as adder. Only 6 common lizards *Lacerta vivipara*, with a similar total to grass snake over the years were recorded and only a single slow-worm *Anguis fragilis*, in a general report. We had two records of the alien red-eared terrapin *Trachemys scripta elegans*, recorded at Tattershall Thorpe on 9th May and another at Hartsholme on 4th April seen by Geoff Trinder.

Of the amphibians frog *Rana temporaria*, toad *Bufo bufo* and smooth newt *Triturus vulgaris* continue to flourish in Reepham and in general about three times as many frogs get reported as do toads. Maurice Johnson also recorded "an active toad swimming around in a garden rainwater tub in Lincoln City on 4 December." Smooth newt and great crested newt *Triturus cristatus* showed up in average numbers, though the latter are rarely reported.

BATS - Annette Faulkner

At last we are beginning to get a better distribution of records over the whole county, thanks to an increase in the number of bat workers in the Scunthorpe and Grimsby areas, but there are still many records missing/lost from the 1980s and early 1990s for the north of the county.

The first surveys of the year are always of the two hibernation tunnels that have been monitored now for nearly 15 years, with a total of 97 bats counted at the January survey. 5 species of bat use the tunnels, with the biggest concentrations being of Natterer's *Myotis nattereri* and Daubenton's *M. daubentonii*, with smaller numbers of whiskered *M. mystacinus*, Brandt's *M. brandtii* and brown long-eared *Plecotus auritus* bats, though these

numbers are generally reckoned to be only about 30% of the actual total because many animals are hidden well out of sight.

The weather presented few problems during the breeding season in June and July this year and there were fewer calls from people finding abandoned babies. However, since many of these calls are generated via the RSPCA, and we only discovered at the end of August that they were passing calls to local vets (most of whom would simply have put the animals down), or were advising callers to hang the bats in trees, whatever state they were found in, instead of referring them to the Bat Group for advice, this may not represent the true picture.

Licensed members of the Bat Group continue to do quite a lot of work for English Nature, although this has now been contracted out to specialists, and for the last year we have had the privilege of being able to draw on the expert advice of The Robert Stebbings Consultancy at Peterborough, not only for routine EN work, such as roof repairs and timber treatment where there are bat roosts, but for many other bat matters too. In addition we have done a number of bat surveys in the county's churches this year and we are building up extensive records of these extremely important strongholds for the county's bats, with one of the most exciting records this year being the rediscovery of Natterer's bats at Theddlethorpe All Saints, first recorded in 1904, when 2 were taken from there and the bodies presented to Lincoln Museum. Tolerance of bats generally is improving, though problems still crop up from time to time.

The other exciting find was much closer to my home in the south of the county. In September I was taking part in a guided walk round Spalding Cemetery and the adjacent Vernatt's Nature Reserve, when one of the group passed me a dead bat she'd found on the edge of the roadway. This turned out to be a dried-out specimen of an immature whiskered/Brandt's bat (it was too decayed to tell which), indicating a breeding colony nearby. These species are widespread in the west and centre of the county - though largely undifferentiated - but rare in the Fens, with few other records.

Readers will probably have seen in the press that pipistrelles have now been split into two separate species, following confirmation by DNA testing of what has been suspected for some years. In Lincolnshire we have followed the national pattern of separating them according to their peak echolocation frequency and they have hitherto been known as '45'(kHz) or '55' pipistrelles. They have now been officially named as *Pipistrellus pipistrellus* ('45') and *P. pygmaeus* ('55'), with *P. pipistrellus* being called the common pipistrelle; the jury is still out over a name for *P. pygmaeus*, with the 'soprano' pipistrelle being one possibility. Which species the type specimen, held at the Natural History Museum, is unknown, as their specimen has lost its head, and the physical differences lie in the colouring of the facial mask! The two species seem to be equally distributed in the county.

The Bat Group has an ongoing project that involves sending out questionnaires to people who have had bat roosts recorded 6 years previously. In 1999 48 questionnaires were sent out, with 60% returned. Roosts are still being lost, but some were obviously transitory and only 2 long-standing roosts had disappeared. In most cases the species of bat is not known but the majority will almost certainly be pipistrelle sp. What is becoming increasingly apparent is how faithful to their roosts brown long-eared bats are: some have been using the same roosts for a great many years. In addition about 50 people take part in the National Bat Colony Survey every year, the results of which are fed through our records before being passed on to the organisers at Peterborough .

Finally, in the next 18 months we are hoping to computerise our records. Eventually we hope to map the distribution of our commonest species in rather more detail than just 10km squares: for brown long-eared bats in particular this should prove fascinating, as already some very interesting correlations are emerging.

References

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TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 1999

President	Mr Graeme Clayton	President Elect	Mrs Irene Weston
General Secretary	Mr Phil Porter	Treasurer	Dave Bromwich
Auditor	Mr John Levine	Membership Secretary	Mr Allan Binding
Publicity Secretary	vacant	Programme Secretaries	Mr Neil Pike
Sales secretary	Mr Dave Bromwich		Mrs Annette Faulkner
Publications Editor	Dr Roger Key	Records Secretary	Mr Neil Pike
External Representatives	Mr Dave Bromwich, Mr Graeme Clayton, Dr Roger Key,		
Mr Ken Rowland.	Executive Committee Mr Mark Crick, Ms Sara Bright, Mrs Annette Faulkner, Mrs		
Annette Binding, Mr Ken Rowland.	Development Group Dave Bromwich, Annette Faulkner, Roger		
Key & Phil Porter			

Section Recorders

Geology	Mr David Robinson	Butterflies	Mr Allan Binding
Bryophytes/Lichens	Prof. Mark Seaward	Moths	Mr Rex Johnson
Fungi	Mr Ken Rowland	Flies	Mr Andrew Godfrey & Mrs Jillian Mears
Higher plants	Mrs Irene Weston & Mr Marson Peet	Beetles	Dr Roger Key
Molluscs	Mrs Vi Wilkin (N), Mr John Redshaw (S)	Sawflies	Dr David Sheppard
Spiders	Mrs Annette Binding	Ants, wasps & bees	Dr Michael Archer
Isopods& Myriapods	Mr Neil Pike	Birds	Mr Jim Rance
Dragonflies	Mr John Redshaw	Mammals & Herptiles	Miss Norah Goom
Shield bugs	Mrs Annette Binding	Bats	Mrs Annette Faulkner

Secretary's Report, 1999 - Phil Porter

In common with several preceding years, 1999 was a time of mixed fortunes for the Union with positive and counter-balancing negative signs. The membership failed to grow to any degree, certainly, but new members continued to be attracted to the fold. The advent of direct debit to replace bankers' orders helped with the administration of the membership at the Lincolnshire Trust. How convenient it would be if all members could pay by this method.

Continued investigations into the likelihood of re-establishing a county wildlife collection under proper care grind on. Owing to the good offices of Tom Cadbury of the City and County Museum Service, the Union now has access through certain members of the executive to remove elements of the invertebrate collections for much-needed attention from appropriate Union recorders, though this has all too often served to underline the parlous condition of some of the material.

Under the present arrangement, the Museum Service is unable to accept biological

collections into its care, owing to the lack of an appropriate curator. However, not every private body of work consists of specimens. The Union has been offered and has accepted a substantial body of biological records and other materials from Mr. Hoff of Grebby, covering his extensive investigations into the wildlife of his farm. The executive would like to extend their appreciation to Mr. Hoff for this kind gesture.

Recording within the County continues at an impressive level and this is how we tend to judge the health of the Union when all is said and done. The biological records which the Union holds are the key to our present and future value in the role of helping to conserve valuable habitats through providing the solid, unbiased information which can direct planning policy.

The executive is regularly concerned with the future of the Union and its wider promotion in the county and elsewhere is an ever-present theme. The present problem lies in the fact that the main posts are held by active recorders or professional conservationists with limited free time in this pressured world. We would very much like to contact any member with time to spare and committee skills who would like to help in this field by taking up a major post. We do feel that fresh blood in the executive committee would be a catalyst for a new phase of development within the Union.

Lincolnshire Naturalists' Union Membership.

The Executive Committee decided that it is appropriate to publish a full list of members in this millennial year. Members from out of county are included at the end of the list.

Life Members

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Field Meetings in 1999

January 16th Saturday; Whisby SK96

The morning was spent at one of the new pits, soon to be flooded, looking for fossils. The Jurassic clay fauna of *Gryphaea*, crinoids, ammonites and clams was interesting enough, but one of the quarry workers directed us to a fossil 'log'. This turned out to be a huge bone, initially thought to be of dinosaur origin, but which turned out to be mammalian ?shin bone from the immediately post glacial deposits above. This is now at Scunthorpe Museum awaiting identification. The afternoon was spent sorting 'insect jam' as someone described it, samples from insect surveys undertaken by MAFF on woodland restoration schemes, in order to allow the LNU recorders access to the specimens for identification.

April 25th Sunday Ingoldsby Woods; SK93 & Callan's Lane Wood. TF02

The morning meeting was somewhat marred by wet weather and more particularly by the threatening presence of a group of travellers camped in the main rides which did have an effect on the areas into which members felt able to go. Nevertheless an interesting piece of arable set-aside did produce some interesting botanical records. There was a fine boundary hedge of Midland and common hawthorn and also some old field maple trees.

At Callan's Lane Wood, a number of woodland plants were evident at this wood including early purple orchid and sweet woodruff. There were large trees of the wild service and some good small-leaved lime. Herb Paris and angelica were among the herbs recorded. Some of the trees had interesting water-filled rot-holes that were of interest to the invertebrate specialists. Among the butterflies present, the comma was especially notable. Two Nb. Weevils were found *Anthribus nebulosus* and *Rhynchites cavifrons*.

May 16th Sunday; Nettleton TF19

In the morning Paul Holly, Wolds Officer showed the party around the grasslands managed under Countryside Stewardship. These were private fields, one of which was only accessible via a private garden. A grazing regime was in place to restore fine grasses and as a result some of the flowers had been eaten down but marsh marigold, lady's smock and ragged robin were seen in the wet flushes which were a particular feature of the grasslands here. In the afternoon the party visited the Nettleton Grasslands East. These fields on the slopes of the Nettleton escarpment provided marvellous views towards Nottinghamshire across the Trent. They also contained rushy spring-lines and newts were found nearby hiding in the shale outcrops. A larger pool contained tadpoles. The drier grassland contained some interesting plants such as crosswort and eyebright. A set-aside field at the foot of the slope provided perhaps the find of the day in small-flowered buttercup. The final venue was a wet field nearby which contained a small pond with azure damselflies. Common spotted orchids were also seen.

June 20th Sunday; The High Dyke SSSI. SK95 Stapleford Wood. SK85

Two contrasting sections of the High Dyke verges were visited. North of the Sleaford road, the extensive margins were without hedgerows and appeared to have suffered badly from spray-drift from the adjoining fields as the entomologists found the grasses almost devoid of invertebrate life. The diversity of grassland flowers also seemed to be in decline. As a result the party moved to the western verges south of the Sleaford road where a fine range of calcareous plants were seen including dyer's greenweed, autumn gentian, dropwort and common milkwort and the scarce chafer *Omaloplia ruricola* turned up new to the county. Stapleford Wood, the conifer plantation on the site of the old Stapleford Moor, shows little of its heathland origins, and much of the wood was invaded by *Rhododendron ponticum*. A few species of interest were noted along some of the drainage ditches, including banded demoiselles. It was nice to encounter a white admiral.

July 10th Saturday; Grimsthorpe Park TF02

Thanks were due to the park ranger Chris Howes for allowing the members access. This was a hot day and in the Brackenbeds (the medieval deer park), purple hairstreaks could be seen at fairly close range on the low spreading oaks. A noisy family of barn owl chicks made their presence felt from their nest in one of the veteran oaks that the park shelters. Hornets were also present causing alarm among the moth trappers for the night ahead! At Pots & Pans in the afternoon there were a number of significant plant records including early gentian, autumn gentian, (and probably some hybrids too), purple milk-vetch and wild liquorice, and marbled whites were numerous in one area which may well be their only county station. In the evening at the moths and bats session, the moths traps provided a moderately good catch including straw dot, scarce footman and four-dotted footman.

August 15th Sunday; Bagmoor Lane & Bagmoor Farm Gullet SE91

The group found that areas of sandy heath, with sand sedge, heather, heath cudweed and other interesting dry-ground plants had been planted up with trees including sycamore and even alder. As a result of this meeting, the executive committee has written to Forest Enterprise to request relocation of the plantings and this is now under consideration.. Also recorded were meadow saxifrage, small -flowered buttercup and water horsetail. The meeting was well attended and the grayling butterfly, a selection of dragonfly species and a good number of other heathland invertebrates were found. Bagmoor Farm Gullet is a linear ironstone quarry which provided a great variety of wildlife so it is worrying that it seems to be threatened with landfill. Grayling was also present here together with brown argus, while a variety of wetland plants including brookweed, marsh orchids and hemp agrimony indicated the variety and quality of habitat. There was a range of fossils to be found in the rocks abandoned at the sides of the quarry. The Nationally Scarce soldierfly *Stratiomys singularior* was also found here.

September 26th Sunday; Swanholme Lakes LNR & Hartsholme Country Park SK96

This meeting examined the heathland of Swanholme where mosses and lichens are of great interest, especially now that public access has been controlled. The red fruiting bodies of *Cladonia* lichens were particularly noticeable. The President Graeme Clayton explained the management of the area. Sheeps-bit was a notable plant on the dry sand. On the lake edges were areas of pillwort and, unfortunately, the invasive *Crassula helmsii*. Pochard and wigeon were among the wildfowl noted. The afternoon session at Swanholme had to be rather quickly abandoned owing to heavy rain. A number of tree lichens were examined in the time available.

October 17th Sunday The Fungus Foray: Langholme Wood SK79

The fungus foray was successful in the range of species obtained and the results can be seen in the section reports. The lichen and heather areas among the trees were admired and there are being extended by selected clearance especially where sycamore is involved. Five species of shieldbug were recorded along with two very scarce beetles.



November 21^s Sunday Gibraltar Point TF55

After initial confusion about the teime and leadership of the group, Dave Bromwich was elected to lead the group around the new areas of Jackson's Marsh and the Syke's

Fungus foray at Langholme Wood

photo RS Key

Farm area of this reserve. The view from the bird hide across the new scapes showed the area to have been colonised by a variety of ruderal plants and the group noted an interesting small scale mosaic of ancient coastal soils, varying from sands to clays and with impressive banks of old seashells.

Contributing to “The Lincolnshire Naturalist”

We are constantly on the lookout for full length articles or short notes, even a few lines which can be useful space fillers, on any aspect of our natural history, current or historic. Consider a note in “The Lincolnshire Naturalist” for any new or significant observations.

Articles should be typed. It would help the editor *tremendously* if they could either be e-mailed or sent on a 3½" computer disk with accompanying paper copy, in just about any word processor format (although don't let this put you off sending in an article) and in the format described here. Adding an ASCII text file in addition to the word-processed file will ensure that it can be incorporated directly. Most word processors can also output in ASCII. Drawings, black & white photographs, colour transparencies or negatives (please include a print) can be included. Colour illustration may be rendered to black & white. Please give a caption. Illustrations will be returned and edited text resubmitted to the author for approval and proof-reading before publication. Convention adopted for names - Latin names should be *italicised*, **not** (bracketed) or underlined and should follow the English name (where applicable) with no separating comma. English names should start with lower case letters unless incorporating other names warranting capitalization (eg Brandt's bat). References to journals and books should please be as below. Please note and use the capitalization and italic convention.

WOODRUFFE-PEACOCK, Rev E.A., 1900. The Lincolnshire Naturalist's at Freiston. *The Naturalist*, **25**: 141-144.

DUDDINGTON, J. & JOHNSON, R. 1983. *The Butterflies and Larger Moths of Lincolnshire and South Humberside*. Lincolnshire Naturalists' Union. Lincoln. 299pp.

A guidance note is available and is sent out to recorders. Otherwise, please attempt to imitate the format in this issue of the Lincolnshire Naturalist.

The final copy date is **31st March** of the year in which the Transactions are to be issued. Please contact the editors directly if there is difficulty in meeting this deadline. If in any doubt as to whether your observation merits a note or an article, or you have any other queries please do get in touch with the editor Dr Roger Key, 67 Peterborough Road, Crowland, Lincs, PE6 0BB, tel 01723 210541, to whom texts should be sent.

Editorial Roger Key

Last year I asked for comments for potential changes to the Lincolnshire Naturalist and got remarkably few, from which I'm choosing to interpret a general level of satisfaction with the content. Specifically, I was asked to retain the A5 format to keep shelf runs of a consistent height and to try and do something about the quality of reproduction of the black and white photographs. Well, I've tried. Individual scans by the printers are quite expensive, and I have to restrict these to the colour shots only, otherwise the cost of publication would almost double. I've tinkered about with the images and I hope that this will improve the outcome (obviously I'm writing this before I see the proofs). I've also changed the type of paper upon which it is printed. The current format will be retained for the next four issues.

Another suggestion was to change the numbering system to drop the year of publication from the cover to avoid the confusion between the year of the transactions (in this case 1999) and the year of publication (2000). This has proved inadvisable, as the year of publication is the correct reference for the journal issue, as recorded by the British Library and omitting it would lead to another, perhaps more serious form of confusion, in giving incorrect references to articles published in the journal. See the cover for the new format.

One time consuming job for the editor is the reformatting of articles from contributors into the journal's 'house style'. This year, only three authors followed the guidance note (of which the above is a summary) and I would urge authors in future years *please* to heed the guidance and save your poor editor hours of remarkably unexciting toil!



THE LINCOLNSHIRE NATURALIST

including
Transactions of the Lincolnshire Naturalists' Union
for 1999
Volume 25, Part 1, 2000



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Five Fern Farm Wall at Flixborough (page 13)
Maidenhair spleenwort, harts-tongue fern & wall rue and amle fern
photo by Irene Weston